IDRC
CRDI
CIID

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA

REPORT AND PROCEEDINGS
OF A REGIONAL SEMINAR
HELD IN ADDIS ABABA, ETHIOPIA
28 NOVEMBER – 1 DECEMBER 1988

The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in six sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; earth and engineering sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs : agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Établi à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

El Centro Internacional de Investigaciones para el Desarrollo es una corporación pública creada en 1970 por el Parlamento de Canadá con el objeto de apoyar la investigación destinada a adaptar la ciencia y la tecnología a las necesidades de los países en desarrollo. Su actividad se concentra en seis sectores: ciencias agrícolas, alimentos y nutrición; ciencias de la salud; ciencias de la información; ciencias sociales; ciencias de la tierra e ingeniería; y comunicaciones. El Centro es financiado exclusivamente por el Parlamento de Canadá; sin embargo, sus políticas son trazadas por un Consejo de Gobernadores de carácter internacional. La sede del Centro está en Ottawa, Canadá, y sus oficinas regionales en América Latina, África, Asia y el Medio Oriente.

This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

IDRC-MR233e
April 1990

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA
Report and Proceedings of a Regional Seminar

Addis Ababa, Ethiopia
28 November - 1 December 1988

International Development Research Centre (IDRC)
&
Pan African Documentation and Information System (PADIS)

Shahid Akhtar
Editor

Material contained in this report is produced as submitted and has not been subjected to peer review or editing by IDRC Communications Division staff. Unless otherwise stated, copyright for material in this report is held by the authors. Mention of proprietary names does not constitute endorsement of the product and is given only for information.

90-06129/ 4

TABLE OF CONTENTS

Page No.

FOREWORD iii

I. A TECHNICAL, ANALYTIC REPORT OF THE SEMINAR 1
C. Kisiedu

II. THE PROCEEDINGS

ISSUES PERTAINING TO NATIONAL INFORMATION POLICIES IN AFRICA: AN OVERVIEW 68
D. Abate

III. LITERATURE REVIEW

1. NATIONAL INFORMATION POLICIES, PLANS AND SYSTEMS IN SUB-SAHARAN AFRICA 91
C. Kisiedu

2. NATIONAL INFORMATICS POLICIES IN SUB-SAHARAN AFRICA 151
E. Zwangobani

IV. SELECTED COUNTRY STUDIES

1. KENYA: NATIONAL INFORMATION AND INFORMATICS POLICY 177
M. Kariuki, E.K. Muthigani, J.M. Ng'ang'a, S.K. Nguli

2. BOTSWANA: DEVELOPMENT AND CO-ORDINATION OF INFORMATION AND INFORMATICS POLICIES 205
A. Datta and M. Baffour-Awuah

3. ZIMBABWE: STATUS OF INFORMATICS 223
E. Zwangobani

4. MALAWI: NATIONAL INFORMATICS POLICY 231
S. Mwiyeriwa and R. Masanjika

5. TANZANIA:
i) POLICY-MAKERS' AND PLANNERS' VIEWS ON INFORMATION/INFORMATICS POLICY IN TANZANIA 243
N. Mlolwa and D. Sawe

ii) A PRACTITIONERS'S POINT OF VIEW ON NATIONAL INFORMATICS POLICIES IN TANZANIA 263
C. Ndamagi

Note: A detailed Table of Contents appears at the beginning of each paper.

V. ABSTRACTS OF OTHER SEMINAR PAPERS 287

EXPERIENCES OF NORTH AFRICAN COUNTRIES IN
THE FORMULATION OF NATIONAL INFORMATION POLICIES
Ahmed A. Bassit

NATIONAL INFORMATION POLICY IN ZIMBABWE:
A PRACTITIONER'S POINT OF VIEW
S.R. Dube

PLANNING, INFORMATION AND INFORMATICS
ECA Socio-Economic Planning and Research Division

INFORMATION TECHNOLOGY IN GOVERNMENT:
THE AFRICAN EXPERIENCES
Mohan Kaul and Han Chun Kwong

NATIONAL INFORMATION POLICY:
THE ETHIOPIAN EXPERIENCE
Teferi Kebede

NATIONAL INFORMATION POLICY
FORUMUATION PROCESS IN ZAMBIA SINCE 1970
Maurice Lundu

POLICY-MAKERS' VIEWS ON THE INFORMATION/INFORMATICS
POLICY: THE ZAMBIAN EXPERIENCE
Maurice Lundu

NATIONAL INFORMATION POLICY IN TANZANIA.
ATTEMPTS AT FORMULATION: A PRACTITIONER'S VIEW
O.C. Mascarenhas

NATIONAL INFORMATICS POLICIES.
A PRACTITIONER'S POINT OF VIEW: ZAMBIA
Ndhlovu Shitima

INFORMATICS AND UNESCO
Unesco IIP

FOREWORD

The Regional Seminar on National Information and Informatics Policies for Africa took place at the Headquarters of the Economic Commission for Africa (ECA) in Addis Ababa, Ethiopia from 28 November - 1 December 1988. This gathering was unique in being the first of its kind to examine information and informatics policies for development in Africa, particularly for a select number of countries in the East and Southern Arican sub-region.

The seminar was organized jointly by the Pan African Documentation and Information System (PADIS) and the International Development Research Centre (IDRC), Ottawa.

PADIS has played a central role in the promotion of information and informatics policies in Africa, from its origins in 1982 as a project at ECA on regional bibliographic information, to its present, more holistic efforts toward the improvement of development information resources, networking and databases.

IDRC is one of the few donor agencies with programmes dedicated to enhancing information and informatics capabilities in developing countries. Over $20,000,000 have been distributed to some 50 projects in this area in Africa alone.

Sectoral fragmentation of information is the norm in much of Sub-Saharan Africa. A holistic approach to information is necessary for the optimum utilization of this scarce resource. Information policies, within the framework of overall national development policies and plans, can help countries achieve this goal.

In 1989, IDRC's Information Sciences Division published an Information Strategy for Africa[1]. The major objectives of this strategy are fivefold: first, to encourage sharing of information - locally, nationally and regionally - and to promote standards and compatibility among national and regional information systems; second, to improve the capacity among African nationals for planning and implementing information and informatics policies, and increase the use of local experts in information handling; third, to promote participation by poor people by supporting information systems that address local problems, and improve access of local development researchers, decision-makers, and practitioners to relevant information; fourth, to build human resources in information sciences

---

[1] IDRC. 1989. Sharing Knowledge for Development: IDRC's Information Strategy for Africa. Technical Study 64e,f. Ottawa: IDRC.

- specifically, to impart skills in managing information systems, in acting as agents of change, and in soliciting and sharing knowledge produced in Africa; and, fifth, to ensure that information initiatives are sustainable.

Sectoral fragmentation of information is the norm in much of Sub-Saharan Africa. A holistic approach to information is necessary for the optimum utilization of this scarce resource. Information policies, within the framework of overall national development policies and plans, can help countries achieve this goal.

African practitioners as well as decision-makers and policy-makers who are aware of information issues, are demanding that their governments formulate specific information and informatics policies. We have all come to realize that co-ordination, resource sharing, and information exchange are futile in the absence of explicit principles and directions articulated in policies. Policies are declarations of intent to take action, and they help to resolve confusion over who is responsible at the national level for taking stock of advances in technological capabilities as well as of any adverse effects. Information policy also opens the way for an informatics policy which provides guidelines for targeting the most nationally advantageous application of information technologies, computers, and telecommunications, to information systems and services.

In the absence of such policies, governments cannot hope to stimulate an integrated approach to information or to motivate co-ordination and cooperation among existing information agencies or effective use of available professional capabilities.

IDRC's Information Sciences Division plans to help make it possible to implement effective information and informatics policies in Africa, and to enhance the availability of techniques and mechanisms for co-ordination and resource sharing.

The seminar was opened by Mr. J.O. Aiyegbusi, Officer-in-Charge of the ECA on behalf of the Executive Secretary of the ECA, and was attended by participants from the following countries: Botswana, Ethiopia, Kenya, Malawi, Tanzania, Zambia and Zimbabwe. Other participants also included the authors of commissioned papers from Egypt, Ghana, Zimbabwe and the United Nations Educational, Scientific and Cultural Organisation (UNESCO). Staff members of the Organisation of African Unity (OAU), ECA, and IDRC also participated.

The ten papers selected for this publication provide a comprehensive coverage of the seminar's proceedings (papers not included are described briefly in Section V). The opening paper by **C. Kisiedu** (Section I) sets the scene with a detailed analytical summary of the background to the seminar as well as the major issues discussed. Experiences and views of the participants are organized under seven general headings, including information and public policy; rationale and need for national information and informatics policies;

scope of national policies; instruments of policy; the policy process and its key actors; policy issues; and recommendations.

The second paper by **D. Abate** (Section II) is an overview of the issues pertaining to national information policies in Africa. Abate examines the problems hindering improvements in information infrastructure and services; the emerging information needs of Africa and the scope of national information policies in and for Africa. He also discusses the instruments of national information policy, including legislation, national budgets, administrative procedures, and institutions.

Section III of these proceedings includes two state-of-the-art literature reviews. The first review by **C. Kisiedu** looks at the literature on national **information** policies in Sub-Saharan Africa, with emphasis on Eastern and Southern Africa. It examines UNESCO's role in articulating the need for national information policies generally, and in keeping the concept alive by means of guidelines and/or discussions on the policy formulation process. Kisiedu discusses the role of UNESCO, IDRC and DSE in encouraging, through moral and material support, the development of policy in the region, and the resulting momentum resulting in the establishment of various systems. This momentum has manifested itself in a spate of meetings, workshops and seminars at both regional and national levels, which Kisiedu also examines.

The second review by **E. Zwangobani** looks at literature pertaining to national **informatics** policies in Sub-Saharan Africa. In order to gain access to available literature, Zwangobani interviewed key informatics personnel in Kenya, Tanzania, Zambia, Zimbabwe, Botswana. Zwangobani's survey includes an analysis of the various levels of computerization; the role and scope of a national informatics policy; national issues such as centralization vs. decentralization, planning, employment, access to data, education and training; and the situation in target countries. He also provides a comparative analysis based on policy issues by country.

Section IV comprises six papers studying information or informatics polices of individual countries. **M. Kariuki, E. Muthigani, J.M. Ng'ang'a** and **S.K. Nguli** present the first country study which reviews the status of Kenyan information and informatics policy, and suggest issues that the new national policy should address. Kenya does not have one comprehensive national information and informatics policy. The existing policy consists of several sectoral laws, regulations and guidelines that influence functions of information agencies and industries. The paper points out the need for a comprehensive national policy that will address issues of co-ordination between/among various sectors; mechanisms for establishing priorities in resource allocation; manpower development; monitoring of policy implementation; development of the informatics industry; and importing foreign technology.

The second country study by **A. Datta** and **M. Baffour-Awuah** examines the situation in Botswana and discusses the existing problems in co-ordinating the functions of various information agencies and industries. It reviews the process leading to the creation of a National Coordinating Council for Information (NCCI). It is expected that the NCCI will eventually be entrusted with the task of formulating a comprehensive information and informatics policy for Botswana.

E. **Zwangobani** presents the third country study which looks at the status of informatics in Zimbabwe. Computer applications in both public and private sectors are examined, as well as the role of telecommunications, software houses, consultants, and evaluation and training. Zwangobani identifies various government ministries as key actors in the process of policy formulation and implementation. He also looks at specific informatics issues such as centralization, acquisition of hardware and software, telecommunications, the role of expatriates, and Zimbabwe's industrial infrastructure.

The fourth country study in Section IV is a paper by S. **Mwiyeriwa** and R. **Masanjika** that discusses information policy in Malawi. Malawi started to evolve a national information policy with the birth in 1976 of the Malawi Library Association. The authors look at a number of developments that have occurred since 1976, including the efforts of individual institutions to take appropriate action to facilitate endorsement of a national policy. The introduction of informatics into Malawi, however, is recent. In spite of the Government's interest in achieving standardization, the formulation of an informatics policy will likely be slow due to the absolute independence enjoyed by institutions venturing into the field of informatics.

N. Mlolwa and **D. Sawe** present the fifth country study which reviews historical developments leading to the current programs, policies and practices relating to information and informatics policy in Tanzania. Although Tanzania has achieved some progress towards the formulation of a national policy, much work needs to be done to create a comprehensive national policy. The paper, then, discusses various factors that must be taken into consideration in order to develop a successful national information and informatics policy. These include information type, sectoral priority, resources, institutional and manpower development, and long-term sustainability.

The sixth and final country study is a paper by C. **Ndamagi** which examines the current state of informatics policy in Tanzania, with emphasis on computer technology. It gives an overview of informatics in Tanzania as well as the existing regulations affecting informatics. Current initiatives and the stage reached towards the formulation of an informatics policy are also explained against a background that may have contributed to its delay. The paper also looks at salient issues that the national informatics policy should address.

I should like to thank Ms. Tavinder Nijhawan and Mr. Joseph Potvin for the assistance that they have provided in organizing and editing this report.

Shahid Akhtar
Associate Director
Information Sciences Division
IDRC, Ottawa

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION I

A TECHNICAL, ANALYTIC REPORT OF THE SEMINAR

C. Kisiedu

CONTENTS

A. INTRODUCTION

- a) Substantive Background
- b) Historical Background
- c) The Regional Seminar

B. INFORMATION AND PUBLIC POLICY: DEFINITIONS AND SCOPE

- a) Public Policy
- b) Information
- c) Informatics and Related Information Technologies
- d) UNISIST and NATIS: Their Contributions to Information Policy Concepts and Practices

C. RATIONALE AND NEED FOR NATIONAL INFORMATION AND INFORMATICS POLICIES

- a) Fundamental Information Problems
- b) African Development and Information Priorities
- c) Planning and Information

D. SCOPE OF NATIONAL INFORMATION POLICIES

- a) Broader versus Narrower: The Pros and Cons
- b) Linkages with Other Public Policy Areas
- c) The African Experience

E. INSTRUMENTS OF INFORMATION POLICY

- a) Instruments of National Information Policy and the African Experience
- b) No Information Policy in Africa?

F. THE INFORMATION POLICY PROCESS AND ITS KEY ACTORS

- a) Policy Goals/Objectives
- b) Policy Formulation and Key Actors
- c) Policy Implementation and Key Actors
- d) Policy Review and Key Actors

G. INFORMATION POLICY ISSUES

- a) Centralization and Co-ordination
- b) Critical Information Policy Success Factors
    - i. A thorough appraisal of fundamental information problems
    - ii. Clearly defined objectives
    - iii. Awareness of the importance of information in socio-economic development
    - iv. Coherence within subsectoral information policies and between information policies and other national policies
    - v. Efficient system of implementation and follow up
    - vi. Continuous feedback and review
- c) Human Resources Development
- d) Role of Information Technologies in African Development

H. CONCLUSIONS AND RECOMMENDATIONS

- a) Information Policy
    - i. Definition for Information and Informatics
    - ii. Scope of Policies
    - iii. Policy Areas
    - iv. Policy Instruments
    - v. Critical Policy Success Factors
    - vi. Co-ordination
- b) Main Actors in the Policy Process
    - i. Government
    - ii. Information Professionals

Annex: The Impact of Information Technology Applications in Government

I. REFERENCES

J. LIST OF PARTICIPANTS

A. INTRODUCTION

a) Substantive Background

Development policies are necessary instruments by which Governments define national problems and set goals and direction for the development of national economies. Policies are declarations of intent by Governments to undertake action in given sectors of an economy. They establish rules and regulations, as well as methodologies for action, and at the same time indicate the natural and other resources required for their execution.

Although for the past several years, the economies of developing countries, and practically all African countries, have been experiencing acute recession, there have been successes in such areas of development as population, the environment, nutrition and housing, to name the most prominent. The successes in these and other problem areas have been attributed largely to sound policies, and international co-operative efforts and assistance. These have increased public awareness, co-ordination among participant groups and countries, ensured Government commitment and increased financial flows.

Information policy should benefit from the experiences gained in the above endeavours. Indeed, the case for national information policies (NIPs) for all countries of the United Nations system has been on the international agenda for over two decades now. The initial focus was the UNISIST programme (see SECTION B.d below). Other UNESCO activities in the area of information in the 1960s which culminated in the concept of National Information Systems (NATIS), and the convergence of all these activities and programmes in the General Information Programme (PGI) in the mid 1970s, has kept the issue alive and has also resulted in increased effort on the part of UNESCO and other donor agencies to assist in the process of developing integrated information infrastructures in Member Countries.

The context of this international concern and activity was the critical situation of the information scene in developing countries, especially those of Africa. Weak or non existent information infrastructures had created an acute information shortage which chronic lack of funds and other important inputs had turned into a vicious circle that has played havoc with all aspects of development in these countries. On the other hand, the introduction of new technologies into African countries has brought in its train new dimensions to the information crisis. While African countries have been made aware of the various advantages for development which the application of the new technologies to information processing can bring about, the dangers of improper understanding of their already considerable impact, and the absence of know-how for their sustained operation have also been brought home to them. In the meantime, the rate of acquisition of these technologies has been on the increase. The problem clearly needs an informatics policy in order for the grave issues to be addressed and infrastructural requirements met.

b) Historical Background

Though enthusiastic at first, African responses to the international initiatives slowed down to near-inactivity towards the end of the 1970s. Despite continuing attempts by UNESCO and donor organizations to stimulate and sustain their interest in the development of NIPs, not many countries in Africa gave serious consideration to the idea. In the past decade, however, there have been visible signs on the continent of resurgent interest and activity in the development of information infrastructures at the national and regional levels. Emphasis has been on creating endogenous systems on the basis of local initiatives with external assistance.

The establishment in 1980 of the Pan African Documentation and Information System (PADIS) through international and African action seemed to have triggered these activities. PADIS, the first all-African information system, was designed, among others, to assist in strengthening the information capabilities of African countries, including the formulation of national information policies, so that those countries can contribute to and benefit from PADIS' computer-based files and programmes. Co-operation and sharing at sub-regional level was an aspect of this development. The attempt at establishing the Southern African Documentation and Information System (SADIS) gave impetus to the process of information institution-building in the countries of the Southern African sub-region, ensuring their readiness to participate in that co-operative but abortive endeavour. Thus were born the various adhoc liaison committees which have developed into the present day national co-ordinating committees and councils, focal points for information policy and other information related activities of those countries.

This new spate of activity on the information scene is the result of the combined effects of the widening of the gap between the "information rich" North and the "information poor" South, and the need to bridge this gap.

The above has goaded African information professionals, planners, researchers and other information user groups into accepting the fact that a rational and systematic approach to Africa's information problems need to be found urgently and, that the magnitude of the problem requires the framework of a Government policy for solution. Thus, since 1985, and in the wake of the failed SADIS scheme, seminars, workshops and meetings have been convened, with the sustained assistance and encouragement of UNESCO, the International Development Research Centre (IDRC), the German Foundation for International Development (DSE), the Commonwealth Secretariat, other external donors and Africa's own PADIS. The meetings have brought together various actors on the information scene to countries of the sub-region to deliberate on the problem of access to information in all its manifestations, and the need for policy to provide direction and authority.

Co-ordination of efforts at both the national and regional levels has been a central theme in the new desire to co-operate and share resources [21,30]. Many of these seminars were actually convened to prepare the ground for information policy formulation with the latest UNESCO Guidelines [35] and model national information plans such as the Jamaican attempt, for direction and inspiration. Where actual plans have not yet been formulated, there are serious discussions towards defining the problems and establishing the modalities for NIP formulation.

Concrete policies are also needed in information technology (IT) for the development of infrastructure so that African countries can benefit from the immense possibilities for development that it offers. This need is recognized by all developing countries. It has been addressed (until its recent demise) by the International Bureau of Informatics (IBI), which was created in 1974 by UNESCO to replace the International Computer Council (ICC).

IBI's mandate was, among others, to disseminate knowledge of informatics, promote its use and recommend national and international actions in order to adopt informatics policies and improve administrative methods through its use of "international peace and the common welfare of mankind" [41]. Like its predecessor, IBI was created with a Third World focus and thus had the needs of Third World countries as its guidelines for action. Such guidelines were spelt out in what has become known as the SPIN I Conference - the First World Conference on Strategic Policies for Informatics, which was jointly organized in 1978 by IBI and UNESCO in Torremolinos, Spain [42]. These guidelines, the result of agreements and recommendations adopted at this conference, are regarded as de-facto the first world informatics charter, and have provided direction for many countries and charter organizations, including IBI itself, in subsequent programmes.

Several conferences at governmental level have been held with the objective of promoting policy development, among other concerns, in member countries. One such on standards in areas of potential conflict was the World Conference on Transborder Data Flows Policies of 1980 and 1984. In Africa, IBI's co-ordinating presence has been felt through cooperative activities with the Organization of African Unity (OAU), in the form of conference reports, state-of-the-art and position papers.

In spite of the above, there is an apparent lack of drive towards the formulation of informatics policies in Sub-Saharan African countries in general, but more so in the English-speaking nations of which the countries of the Eastern and Southern African sub-region form a significant part. This may be explained partly by the fact that IBI never really had as strong a hold in these countries as it had in French-speaking Africa. It is worthy of note that out of the governments of 40 countries that represented the membership of IBI, only 3 or 4 were from English-speaking Africa (and of this small total, only one, Swaziland, was from the East and Southern African sub-region). On the other hand, all the French-speaking countries of the continent were members.

A survey of IT development in English speaking Africa undertaken in 1988 by the Commonwealth Secretariat [16] confirms this picture of a generally low level of development in this field in the sub-region as a whole. The review of literature on informatics policies in the sub-region [39] also presents a similar picture. It points out that Zimbabwe is the only country in the area which provides definite evidence of direction and development in informatics and hence the likelihood of coming up with a national informatics policy in the foreseeable future. This view is endorsed by the Zimbabwe presentation on informatics [40]. Thus, it was not by accident that the only IBI sponsored conference in the sub-region - the Southern African Regional Workshop on Informatics - was held in Zimbabwe, in Victoria Falls from 12-16 May 1986 [43].

The above observations provide the context for the regional seminar in Addis Ababa. An increasing number of African countries have attempted to formulate national information policies, which are now at varying stages of implementation. Others have yet to formulate such policies. To move such initiatives forward, it was thought that an exchange of experiences would be useful.

c) The Regional Seminar [4]

The purpose of the Addis Ababa seminar was to provide a forum for experts closely associated with the articulation, formulation and implementation of national information and informatics policies in a select number of countries in the East and Southern African sub-region to exchange views and share experiences. The sponsors also felt that by providing this forum, and by distributing widely the inputs to and the results of the seminar, valuable contributions would have been made towards advancing the formulation and implementation of sound information and informatics policies in the African region.

The seminar was organized jointly by PADIS and IDRC and funded by the latter. Participants comprised experts drawn from the community of information, documentation, library, computing and related professions, as well as from development policy-makers and planners principally from the countries of the East and Southern African sub-region including Botswana, Ethiopia, Kenya, Malawi, Tanzania, Zambia and Zimbabwe. Two or three participants were selected from each country and were expected to present an integrated country paper. A co-ordinator was identified for this purpose in each country by the seminars sponsors.

In addition to the country papers the following were also presented: (a) a paper on the experiences of African countries in formulating and implementing development policies in general, titled: "Planning, Information and Informatics", by the Socio-Economic Planning and Research Division of the Economic Commission for Africa (ECA); (b) a paper on Informatics and UNESCO presented by the Inter-Governmental Informatics Programme (UNESCO IIP); (c) a paper on Issues Pertaining to National Information Policies in Africa delivered by PADIS; (d) findings of the study on informatics policies in Commonwealth African countries titled "Information Technology in Government: The African Experiences", delivered on behalf of the Commonwealth Secretariat; (e) a paper on the experiences of the Arab North African countries in the formulation and implementation of information and informatics policies; and (f) literature surveys on information and informatics policies in some sub-Saharan African countries.

The present report provides an analytical summary of these varied experiences in seven broad, substantive sections:

B Information and Public Policy;
C Rationale and Need for National Information and Informatics Policies;
D Scope of National Policies;
E Instruments of Policy;
F The Policy Process and its Key Actors;
G Policy Issues
H Conclusions and Recommendations.

B. INFORMATION AND PUBLIC POLICY: DEFINITIONS AND SCOPE

a) Public Policy

Information policy is an aspect of public policy in most countries, whether articulated or not, because information permeates and fuels every aspect of national activity. It can also derail or itself be derailed by national policy if the proper relationships are not established between the two areas at the initial stages of policy formulation. (This issue is discussed in depth under SECTION D.b). It was therefore considered necessary, for the purposes of the seminar, to establish the domain of information in order to provide a framework for the deliberations on national information polices in the wider context of public policy. In the same way, public policy establishes the contextual framework for the necessary linkages between sectoral policies on the one hand, and between the latter and overall national policy on the other. Therefore, the need was also felt to define or establish this framework of relationships, goals and procedures into which a national information policy should fit in order to succeed.

A small number of the contributory papers offer varied definitions of public policy, but they all emphasize some basic, common characteristics. These include, among others, the fact that public or national policies are planning tools; that they set national goals in the context of national needs and objectives, and establish coherent and systematic modalities for achieving these objectives; that policies could be of a general, integrated nature affecting the entire national economy or, as is often the case, that policies may also be sectoral and operate within the context of the overall national objectives.

One of the presentations by Tanzania [21] briefly defines public policy as:

> "a deliberate course of action carefully selected to meet certain clearly defined objectives within a specified time frame."

This source recognizes national policies as planning tools which take cognizance of national needs and objectives and set a course of action to achieve them. Such policies can be general and may affect the entire national economy while others deal with particular sectors but within the context of the overall national objectives. It also emphasizes the linkages and cohesiveness that are necessary for goal achievement in a time frame.

The UNISIST Guidelines [35] define policy as "basic principles or assumptions on which a programme of action is based". In his review of the literature on national informatics policies in African countries, Zwangobani [39] endorses this definition and agrees further with the UNISIST Guidelines that policy can also refer to a general plan of action or plans and strategies. In addition, he sees national or public policy in the "integrated", holistic sense, recognizing the interconnections between sectoral policies that are essential to successful implementation and goal achievement in any given sector.

By far the most comprehensive definition of policy is offered by ABATE [10] who examines definitions and analyses from various sources. Beginning with the Oxford Dictionary's general definition, the paper progresses to more specific and precise statements called from such authors as SPENGLER, KIVINIEMI, ADEDEJI, to name some of them. [Please refer to Section II for the full text of this paper].

SPENGLER, for example, cautions against dictionary definitions for their lack of specificity for most purposes of analysis, while KIVINIEMI notes, in addition, the role of policy as a means by which Government controls the actions of policy executors and of the citizenry at large away from the usual. ADEDEJI emphasizes the importance of a systematized approach to goal achievement or problem solving that is inherent in public policy. This point of view is shared by the Seychelles Roundtable's definition of 1980 dedicated to "Public Policy in Africa" and endorsed by the African Association for Public Administration and Management (AAPAM).

In addition, these sources also stress the relevance of harmonization of sectoral policies with total policy which BAGUMA regards as a sine qua non for goal achievement. KIVINIEMI bases his support of this view on what he refers to as the "little effect phenomenon", the repeated or partial failure of intended policy programmes that one finds in case studies on public policy, which he attributes to lack of coherence or interaction between sectoral policies operating at any given moment.

b) Information

The seminar noted the often cited absence of a common definition for information as reflected in the attempts made in some of the presentations at providing such a definition. Definitions are sector-oriented in some cases, comprehensive in others, depending on the background and interest of the person(s) presenting the definition or making the case, as the information policy drive in Australia has found out at some cost [14].

Another problem related to definition is the close interlinking with scope, especially where a functional definition is required, as in the present exercise. Invariably, definition broadens into a description of the scope and/or functions of the many sectors of the information industry. However, as noted at the beginning of this section of the report, it was deemed necessary to provide a domain for information (in the widest sense) in order to provide a context for the deliberations of the seminar.

As with public policy, a number of the papers presented at the seminar attempted to provide a definition of some sort for information. BASSIT [6] identifies sectoral views, beginning with the concept of national communication policy, "a product of earlier educational planning efforts" as exemplified in the 1975 UNESCO report: National

Communications Systems: Some Policy Issues and Options. He also refers to the science and technology focus on which basis information policy OECD/UNISIST style (initially) developed. Thirdly, he mentions the approach that emphasizes traditional library, documentation and archives, and finally, the informatics and information technology dimensions which derive much of their impact from computer technology. Bassit observes that a heavy emphasis on the importance of information is a common denominator among these approaches, but that by virtue of their narrow, sectoral orientation, they fall short of an acceptable global conception of the total information system. He describes the characteristics and properties and defines the global view of information as:

> "a resource, a production factor which has its place in every system of creation, an element to be taken into account in all decision-making process[es]..., a commodity which, unlike most others, is not exhausted with use."

The literature review on national information policies [18] refers to the standard definition of information provided by PGI/UNISIST (1979) [34]. This is considered a rather technical and abstract definition with no practical context for information. It is observed further that this definition imposes a two-sided narrowing effect on the limits of information largely in terms of scientific and technological information. Secondly, the definition places greater emphasis on print-based information and fails to give sufficient attention to information in non-print format, an omission that cannot be ignored in an age of electronic documentation. It also excludes such organizations and functions as mapping agencies, statistics, remote sensing, etc, that have recently been identified with the information sector.

The Ethiopian paper [33] presents a paraphrase of the UNISIST definition, broadened to bring out the multi-faceted dimensions of information in the development context. This defines scientific and technological information (STI) for development as embracing:

> "the natural sciences and their technologies ... the social sciences and humanities as well as the "soft" technologies related to them ... all of these being covered by the name of specialized information involving a wide variety of institutions such as research [and] educational institutions, statistical agencies, archives, printers, publishers, booksellers, libraries, documentation centres, extension and advisory services, science popularization and literacy programmes, etc."

As can be seen, the above attempt does not escape the print-based nature of the original definition from which it is derived. For the purposes of the seminar, however, the more enriched definition provided by ABATE's paper [10] (see Section II) which sees information in the context of development, was adopted.

With regard to the scope of information, the general consensus is that it should be comprehensive and should embrace all the sectors, institutions and activities identified in the enriched definition cited above. However, traditional practices, experiences and interests as evidenced in practically all the papers on information policy, have a narrow conception of the scope of information based on libraries, archives and documentation centres and their activities [10].

The national information policy efforts manifested in draft policies [27,30,37], discussions and the general thinking reflected in the professional literature (published and unpublished) emphasize document-based information and the primacy of libraries and allied institutions as traditional sources of information in African countries. Thus, information workers in Malawi are described categorically as librarians, archivists and documentalists; the Malawi seminar [30] to articulate specific goals for a national information policy has only those institutions and professionals as target and identifies information institutions and instruments with only those in this sector. Botswana's report on co-ordination of information services [27] lays heavy stress on libraries and emphasizes the media of printed information. Zambia's draft information policy [37] excludes mention of information sources and services other than libraries, archives and documentation centres. The trend is similar in Tanzania where efforts at NIP formulation involve librarians as main actors because "libraries have historically been the major suppliers of information" [21].

One important reason for this narrowness of the scope of information in African countries is that practitioners in the library and other fields of documentary information have traditionally been more closely associated with the provision of information and have consequently played a leading role in the on-going attempts at information policy formulation. Another likely reason is that practitioners in other key sectors of information have excluded themselves and their pursuits from the mainstream of information activities because they did not (until recently in some cases) regard their functions as information functions [10]. This state of affairs was discussed at length at the seminar and countries represented urged to encourage linkages between various sectors of the information profession in order to ensure a stronger lobby for the NIP formulation exercise.

c) Informatics and Related Information Technologies

The development of informatics has been one of the major preoccupations of UNESCO since the 1950s, although the discipline was not introduced into its programmes until 1975. A few of the contributory papers on informatics attempt brief definitions of the term. BASSIT defines informatics as:

> "a complex of scientific, engineering and other technological disciplines and management techniques which are helping to cope with data and information more systematically, without losing sight of their wider social, economic and cultural contexts ... increasingly referred to as informatics."

Reference is also made to the parallel development of associated equipment and procedures which enable the fast and economic handling of huge volumes of data required for development.

An even briefer definition, though a more technical one, is that of the French Academy in 1966 quoted by NDAMAGI, which defines informatics as;

> "The science of the systematic and effective treatment, especially by automatic machines, of information seen as a medium for human knowledge and for communication in technical, economic and social contexts" [25].

This definition is considered still relevant, although it has undergone slight modifications over the years, but it is obviously narrow in expression and scope. A more expansive definition by SAMUELSON, BORKO and AMEY [29] explains that :

> "Informatics stands for Information Science and Technology, defined as that field which includes: Structure and properties of information and communication as well as theory and methods of the transfer, organizing, storage, retrieval, and evaluation and distribution of information, and furthermore information systems, nets, processes and activities that mediate knowledge from source to user and are based on general systems, cybernetics, automation, and technology for human work environments in timely and current praxis."

The seminar expressed concern with this narrow scope of informatics. The general view is that the term is too computer-oriented and excludes other pertinent technologies like telecommunication and other aspects of the electronics industry. Therefore, for matters of policy, the term "information technologies" (ITs) should be preferred. "Information technology" (IT) is thus defined as:

"the application of modern, new tools and techniques to the acquisition, processing (including storage and repackaging) of and dissemination of information".

In scope, information and information technology have a natural affinity towards each other which is seen in the ever increasing integration of ITs in national life manifested in the telecommunications, publishing, computer industries, and in resources inventory, early warning systems and in the increasing application of electronics in traditional information systems and institutions.

d) UNISIST and NATIS: Their Contributions to Information Policy Concepts and Practices

As noted in the introductory section of this report, UNESCO, the lead agency of the United Nations system in the promotion of the development of information within and between Member States, has pursued this policy since its inception. In the process, it has established over the years various departments and programmes. The best known of these are the UNISIST and NATIS programmes, created respectively by the former Division of Science and Technology, in collaboration with the International Council of Scientific Unions (ICSU), and the Division of Documentation, Libraries and Archives, and both of which programmes were absorbed by the General Information Programme (PGI) in 1977.

Kenneth ROBERTS [28] has made a comprehensive and detailed analysis of the activities of PGI in which he traces its origins to the UNISIST and NATIS programmes, and provides a brief resume of the conceptual framework in which the two programmes operated, and the focus of their activities all of which became the guiding principles of PGI at its inception in 1977. These precepts and operational thrusts have been built upon and expanded since then. PGI has been made stronger conceptually and has a clearer operational vision because of the harmonization of the UNISIST and NATIS concepts and activities that the merger brought about. Ulrich GEHRKE [12] provides a more comprehensive, comparative and evaluative account of pre-PGI UNISIST and NATIS programmes in which their contributions to the development of information in general (including their weaknesses) have been highlighted.

The initial objective of UNISIST was to promote the co-ordination of existing trends towards cooperation and to act as a catalyst in the development of scientific and technological information (STI). It emphasized the sharing of information internationally, and its handling through co-operation and standardization among existing systems, so that the flow of information for the world community may be improved. UNISIST requirement that participant countries should already have in place developed information infrastructures, and its natural science orientation, led to a somewhat diminished developing countries focus. However, this gradually increased over the years as the programme's scope expanded to embrace all areas of national activity and the principle of integrated information for development became central to the programme's activities after the UNISIST II Conference in 1979. The literature review [18] (see Section III) demonstrates the course of this evolution as represented in UNESCO documents themselves.

The main thrust of the UNISIST programme was in four main areas, namely, policy formulation; standards-setting; infrastructure-building and manpower-training. However, on the basis of on-going NIP formulation activities in the African region, one could safely state that policy formulation encompasses and provides the rationale for the three other areas of activity. This programme of activities has been pursued through PGI, to encourage many governments to develop information policies as cornerstone to the development of information at the national, regional and international levels.

Many African countries have benefited from the operations of these programmes. For example, between 1986 and 1988, Botswana, Malawi, Zambia and Zimbabwe were the focal points of information policy meetings. In fact policy and infrastructure building activities have often been inseparable. Efforts at promoting the development of information infrastructures are exemplified in the meetings cited above. Another such was the First UNISIST meeting held in Accra, Ghana. (FIRST UNISIST Meeting of Experts on Regional Information Policy and Planning in West Africa, Accra, Ghana, 4-7 December, 1978). UNESCO's involvement with the establishment of PADIS in 1980; its participation in the preparation of development plans for the establishment of SADIS, and in various feasibility studies and field research programmes commissioned by UNISIST for the development of both sectoral and integrated information services and institutions, cited in the literature review [18] are specific examples of infrastructure building initiatives towards eventual policy formulation.

UNISIST/PGI has made a very considerable contribution to the development and training of information manpower through short as well as full-term courses, and co-operative institutional ventures. ROBERTS records that between 1977 and 1980, several international and regional courses were held, three of which were in Africa.

In 1983 a UNESCO-IDRC mission visited six African countries to explore the need for an information science programme and the capacity of the countries visited to achieve this. The team recommended the establishment of two such programes in Africa, one to be based in Addis Ababa University, the other at the University of Ibadan, Nigeria.

The standards setting activities of UNISIST/PGI are well known and well-documented. They have taken the form of the development of technical, normative tools for the design and operation of information systems and services. The objective has been to ensure the establishment and maintenance of common standards in information handling and the unimpeded flow of information at both the national and extra-national levels. Some key PGI documents on standards are listed in ROBERT's article cited above. They provide for activities, institutions and functions across the entire spectrum of information, aimed at ensuring ease of information flow at the national and international levels.

Raymond AUBRAC [3] has identified three levels at which these ideas and activities have been expressed and pursued, the first of which is through an analytical and comprehensive study of the problem such as that which took place during UNISIST I and II conferences. UNISIST II's evaluation of the UNISIST programme led to a shift in the programme's orientation from the development of STI per se to specialized information in the context of national development. This shift is manifested in such recommendations as the promotion of endogenous information systems as important bases for information policy; the recognition of a two-way flow of information from developed to developing countries and vice versa, and even between developing countries; focusing attention on users to better identify their information needs and assist them to utilize available information more effectively. Thus, UNISIST is considered as the "locus of basic precepts on information transfer and use, and the source of national, regional and international operations".

Common standards are also articulated through guidelines - the application level of the basic precepts mentioned above - prepared by consultants in co-operation with international and non-governmental organizations such as the International Council of Scientific Unions (ICSU), the Federation for Information and Documentation (FID), the International Federation of Libraries, Archives and Information Institutions (IFLA) and the International Council on Archives (ICA). These guidelines have established norms and standards in information processing and handling for policy formulation, etc.

Two such Guidelines have been produced - respectively after UNISIST I in 1975 and UNISIST II in 1985 [35]. The latter which represents the latest PGI/UNISIST precepts, has been widely distributed in many developing countries, coinciding, as it does, with the period of heightened activity in national information policy formulation in many of those countries. Many of the draft policy recommendations in the literature review [18], discussed at length at the regional seminar, used the Guidelines as a model. This is because the 1985 Guidelines is much more reflective of current realities in most developing countries. Most of the recommendations centre around an analysis of the existing situation. Current initiatives in a number of the target countries have been taken along those lines by libraries, archives and even some resource centres.

The document points to the underutilization of existing information (as UNISIST II does) and urges the identification of the reasons, and promotion of information use. It also stresses the importance of and the need for co-ordination of information, which is now a permanent agenda item of the PGI/UNISIST programme. The third level also referred to as the "technology level" constitutes the implementation of the precepts established at the first two levels in individual countries and regions in the form of field research projects and reports [18].

The concept of NATIS, an acronym from National Information Systems, resulted from the general demand for a coherent infrastructure covering all information services, and was a reaction to UNISIST's initial, exclusive concern with information in the natural sciences. The programme which was launched at the International Conference on the planning of NATIS (UNESCO, 1974) provided a conceptual framework for the formulation of a national information policy in which objective for national action for the implementation of NATIS were embedded in five precepts: (a) policy, but one reflecting the needs of all sectors of the community, to guide a plan which should be fully incorporated in a country's national development plan; (b) co-ordination of the functions of all library, documentation and archives services through a central body to form the national information system (NATIS), to ensure the optimum use of resources; (c) professional education and training for information manpower as part of the national education system; (d) legislative backing to support the planning and implementation of NATIS; (e) the existence of a mechanism for national bibliographic control to foster the objectives of the concept of Universal Bibliographic Control (UBC), which seeks to ensure that a bibliographic record exists for every publication at the national and universal levels. All of these were aimed at strengthening the information capacities of Member countries, especially developing ones, in the context of national policies.

Through its integrated and comprehensive approach and its advocacy for centralization in the development of information, NATIS presented a framework that was more acceptable to developing countries than that of UNISIST. NATIS also had the vigorous support of all those elements in the information industry who believed that UNISIST, "with its concentration on science and technology, had created an imbalance in UNESCO's information programme" [1]. As originally conceived, UNISIST's concern with the information problems of developing countries was only minimal. It was this, and particularly its exclusion of the social sciences and other non-natural science subjects as a focus of development that prompted the establishment of the NATIS concept. It should be noted, however, that the validity of UNISIST's initial objectives is not in question. However, as BASSIT observes, "in the context of development issues and in the light of the new concept of international economic order, it seems understandable that its emphasis was shifted to recognize STI not for its own sake but for its social and economic value."

As can be seen from the precepts and operations of the two programmes as identified above, UNISIST and NATIS pursued basically different aims but employed largely identical means [12]. For example, the principle of national participation which forms the basis of NIP activities in African countries is a requirement that is common to both, and was based on common UNESCO experiences. In fact, practically all the NATIS precepts could also be identified with those of UNISIST. The often quoted rivalry between the two programmes emanated from the fact that although they were from the same source, they were offered separately and were unco-ordinated.

As noted above, the creation of PGI has brought to an end this duplication on the part of UNESCO, the rivalry between UNISIST and NATIS and, to some extent, restored equanimity to developing countries regarding which way the information policy and systems debate is heading.

However, more than a decade after the merger with PGI, some African professionals still cling to the term NATIS and have based on-going information policy formulation exercises on its precepts [9,30,37]. It is a measure of the great appeal that the concept had for African countries, as noted above. It also indicates that the confusion is not quite cleared. In spite of the merger, the term UNISIST continues to be used, and specific programmes and projects are attributed to it, although NATIS has gone out of UNESCO usage. Authoritative sources in UNESCO (ROBERTS, for example), state that "the retention of the name 'UNISIST' had been recommended by the General Conference for "appropriate use". Personal communication with PGI reads: "NATIS concept and UNISIST programme have been absorbed by General Information Programme (PGI). No use is made of the term NATIS. Only UNISIST appears on PGI documents". This means that the NATIS concept has no separate identity under PGI, and that NATIS as a term ceased to be used after 1977.

Despite the initial rivalry and confusion, the contributions of UNISIST and NATIS to the ideal of information for development have been considerable. Shorn of the problems, which were largely operational and managerial, the precepts they established; the tangible output, and the benefits to African and other developing countries as well as the international community in general, cannot be denied.

C. RATIONALE AND NEED FOR NATIONAL INFORMATION AND INFORMATICS POLICIES

a) Fundamental Information Problems

A recent editorial article on current thinking and progress on the issue of national information policies in Australia which appeared in the Journal of Information Science (cited already) [14] would seem to discourage, on the face of it, the whole issue of national information policy formulation in a profession riddled with competing interests, lacking a coherent and well defined identity and dominated by a sector whose operations and intentions are viewed with suspicion by other sectors. This may well be a valid line of argument in economies where, in spite of lack of policies, information development programmes proceed relatively satisfactorily because viable information infrastructures exist already, and the value of information is recognised and appreciated at policy level.

The situation described above is not an unknown phenomenon, nor are its unfavourable consequences. Expert opinion [35] agrees that even where the importance of information services are appreciated by high-level policy-makers, the need for a coherent and systematic national information policy and plan may not be appreciated; that in the absence of such information policies and plans incorporated or closely geared to development plans, relevant information may be utilized but in a haphazard manner; that decision-making based on such information tends to be ad-hoc because it is not backed by all the relevant information that could have been mustered. This strengthens the case for information policies, generally. African countries require to establish such policies to enable them to overcome fundamental information problems through adequate inputs of information, infrastructural and other relevant requirements that ensure improved performance.

The impact of the new technologies on information and on society as a whole, given the pace of their rapid advance and the prospect of cheap storage, handling and dissemination of information, needs to be given closer attention. The enormous capacity for handling information offered by some of these tools has increased the potential for meeting the needs of users. All this can be taken into account properly only in the context of national policies.

The situation in African countries calls for such an approach. Information infrastructures are weak or non-existent in some cases. There is an acute shortage of qualified personnel and skills at all levels of the information profession. Insufficient awareness by policy-makers in Africa of the relevance of information in national development is still a constraint on progress in that sector. And, chronic shortage of funds for, or indifferent funding of information programmes, and many other constraints have together created a crisis of access to information which can only be solved in the framework of an articulated policy for the information profession. An awareness of these constraints and their effect on access to information now exists, and provides the impetus for the on-going talks and activities on information infrastructure building; it also provided a context for the deliberations of the regional seminar. Some of these constraints as identified at the seminar, and as raison d'etre for formulating NIPs, are discussed in depth by ABATE's paper [10], although all the country presentations [5,8,9,15,19,20,21,23,24,25,32,33,40] and most of the other papers [6,18,39] treat them in varying detail. The policy drafts also present their case on the basis of these problems.

Inadequate financial and material resources for information pursuits are cited by all contributions as by far the greatest constraint on information and informatics infrastructure building. This situation is exacerbated by the widely held view that African bureaucrats do not appreciate the relevance of information in problem solving. Although there is reason to believe that individual attitudes are changing for the better in this regard [2], institutional responses to the needs of the information profession do not reflect this change. The situation is not helped by the general national financial stringencies, the foreign exchange dimension of which is recognized as an insurmountable problem in an import-dependent sector like information, particularly the informatics sub-sector.

Shortages of qualified personnel in all sectors and at all levels of the information industry are reported as a pressing problem that needs urgent attention. This issue is given detailed analysis in SECTION G.c (Human Resources Development).

Inadequate infrastructure in terms of physical facilities available to most information centres constitute another basic information problem. Libraries and other information institutions in Africa lack basic equipment, demonstration and reading room facilities. Documents are out of date and new ones are unaffordable [21]. At the same time, the existing resources are not utilized to full capacity because there is little or no sharing of the resources by means of co-operative efforts and marketing of information. These infrastructural problems have resulted in a crisis of accessibility of information which was discussed exhaustively at the seminar. There is general agreement that African countries have sufficient information lying around; that there is need to mobilize and use it. The problem is how to find and mobilize it for use. ABATE [10] traces the cause of underutilization of available information to the imbalance in the supply and demand of information and the fact that "too much emphasis has been placed on the supply of services and too little on mobilizing demand".

As regards its infrastructure, major computer centres in Malawi, Tanzania and indeed, in most sub-Saharan countries, have been set up as data processing departments (DPDs) within, for example, Ministry's of Finance and Department's of Statistics. These cater for government only. Private institutions and business organizations like banks and industry have installations which cater for their own requirements. These exclude the general public.

Underutilization of resources is also a problem here. Computers are not used at full capacity because applications are at an early stage, and are limited largely to the commercial sector. This situation can also be attributed to lack of sharing and co-ordination. The computer agencies are in competition and are not eager to consider the idea of sharing. Even Governments demonstrate an inherent problem because of the set up within which the administrative units related to informatics operate, scattered under as many different authorities as there are sectors. This causes administrative bottlenecks and slows down progress. It also results in waste of efforts, particularly in the area of software applications [25]. Agencies produce their own software, and there are a few firms that offer consultancies. It makes standardization also difficult if not impossible.

Awareness at the policy level of the importance of informatics in development is professed but, with the exception of Zimbabwe, the tendency to control rather than promote the development of this sector by means of restrictive rules and regulations governing the acquisition of informatics equipment and products reported in all countries [15,16,23, 25,32,39,40] certainly puts the brakes on development. Lack of understanding of the full potential and the impact of informatics on society creates a suspicious outlook which engenders doubts as to the relevance of informatics in development. Such a situation is reported to have existed in Tanzania in the 1970's and resulted in the return to manual systems and a complete ban on the importation of computers and related informatics equipment [25].

b) African Development and Information Priorities

A fundamental characteristic of African development in the last two decades is the ever worsening social and economic conditions. Several causes have been attributed to this state of affairs, including adverse climatic and environmental conditions, unfavourable international economic relations, and simple mismanagement of the economy on the part of Governments. This has resulted in changes in development priorities which have, in turn, called for corresponding changes in information services and the systems that would meet their new needs [10].

Agriculture in sub-Saharan Africa, with its complex and multi-dimensional nature, has become a developmental priority and "the cornerstone of domestic economic relations". Agriculture and agro-industries is an area that demands a changed focus in the service provided by the information sector. There are already in existence in many African countries agricultural libraries, information and statistical centres. The problem is how these largely traditional, document-oriented institutions could meet the needs of multidisciplinary, agricultural development concerns and the heterogenous user environment. Only the recent technological advances in remote sensing, communication and data processing possess the potential that can meet the challenges of innovative information collection, processing and delivery methods, and continuous R & D and updating of those methods.

Trade, industrialization, transport and communication and natural resources exploitation form a second subject area of change. However, African Governments do not possess in-depth knowledge of the extent of their natural resource base [10]. This area is also a main domain of the private sector, but the information needs and information seeking behaviour of the African private sector is still very little known or understood. This is due partly to the fact that the private sector has been excluded from the on-going exercises in information infrastructure building and policy formulation, a situation which evinced concern and comment at the seminar. It is also seen as due to the fact that an indigenous private sector is only just emerging, and that the dominant foreign multinational concerns depend on their parent metropolitan companies for information.

For the above noted and other reasons, trade and industrial information services are still at an embryonic stage of development. However, as noted, current thinking and trends are in favour of a shift from the conventional approach to information handling that places emphasis on printed, textual sources in favour of information decision-support systems that embrace innovative activities and services identified in the seminar's enriched definition of information. Such systems will hopefully respond more adequately to the emerging developmental challenges.

c) Planning and Information

African countries adopted planning as an instrument for economic and social development after the attainment of political independence in the early 1960's. This was in response to models established after the First World War when the imperatives of reconstruction and socio-political changes made government intervention in development popular, set against the regression of free market economies of the 1920s. The approach, however, was not uniform in all African countries. While a few followed the Soviet system quite closely (e.g. Algeria and Egypt), most opted for the various forms of "indicative" planning, i.e. planning at the macro economic level, based on consensus between government and the different economic agents of the country to ensure realism in plan objectives. Nevertheless, government intervention has been evident in the development process of most of these countries. This has been exemplified in government ownership of or participation in business, industry and agricultural concerns, Marketing Boards, the introduction of exchange control systems and reliance on such macro economic tools as the budget and fiscal policy in general [11].

One of the most common manifestations of planning at the macro level is the formal development plan by means of which goals are set on the basis of "informed" projections over a specified number of years. Zambia, for example, has had three five-year development plans and two interim national development plans [20]. Tanzania records a long history of centralized planning which dates back to the early colonial days, beginning with the Planning Agency of the Colonial Development act during the British Mandate period [23]. Although the emphasis and methodology of development planning have changed considerably since then, the actual process of central planning is thus not a recent feature in Tanzania's national economy.

By the mid 1970s, however, there was a movement away from planning towards a free market economy in many African countries. This was triggered by (i) the oil crisis of 1973 which created a huge debt in the foreign reserves of most of these countries as a result of huge oil bills; (ii) the failure to raise productivity in several areas of the economy and, more relevant to the purpose of the seminar, (iii) lack of information.

Planning at both the micro and macro levels require large inputs of information, especially in centralized planning. Starting with the disadvantage of embryonic or non-existent statistical institutions, the newly independent African countries lacked the most basic data on all variables and, in effect, made development plans with very little or no data. The situation has improved since then but not significantly, and African governments have earned the unenviable reputation of planning without information.

Zambia's experience points directly to "difficult access to information and data", "poor data and information flow among implementing units", "poor quality of data" unscientifically derived and therefore inappropriate for analysis, as some of the main reasons for the failure of the implementation of the various national development plans of the country [20]. The main lesson from the above is that information is vital at every stage of the planning process, but that there is a serious deterioration in the quality and availability of information in all sectors of African economies [11].

The new technology holds a lot of promise for the future, with particular regard to information collection, storage, processing analysis and dissemination, on a scale and at a speed which could not have been foreseen some twenty years ago. Possible areas of application in central administration include customs, tax administration and finance. A spinoff in the form of statistical byproduct can be utilized in other areas of administration. Some of these basic applications are already in force in most African government institutions, as noted elsewhere in this report. However, the capacities of the new technologies are underutilized, and the level of use is not yet of much benefit to government [25,32,39,40]. Besides, the existing systems are used largely to process historical data.

Apart from the above, other problems that prevent the effective use of information technology in government institutions were identified in the course of discussions at the seminar. (a) Data collection is still a problem in spite of the new improved data processing systems because "it depends on human action" in different areas of public administration where inefficiency and shortages of skilled manpower are well known. (b) Co-ordination of the disparate information systems in the central administration is cited as another problem [11]. For example, while trade statistics are compiled on a regular basis, data on household expenditure and consumption collected through household surveys, and general census data can only be obtained at intervals of five to ten years. (c) The possibility of information glut due to the limited capacity of planners and other development officials in African countries to effectively use the considerable information which can be generated by a computerized information system. While this last named problem is considered real, it is perceived not as a planning problem but as one of how to manage the information available. Integration of information with planning is certainly lacking. The result is that African countries are "data rich but information poor". Computers are a means to an end, the end being the integration of computer generated data into planning to provide the desired information. So far this has not been possible to any great extent in Africa [16], and information still remains as data in Africa, of little use for planning.

The shift in orientation in planning from centralized to free market economy does not mean that planning has failed. The phenomenon involves the dynamics of change, since planning is a dynamic, not a static process. Planning and information need to be integrated. The one cannot succeed without the other. As a corollary, the efficient use of the possibilities offered by IT to generate development information and ensure integrated information systems cannot be effected unless definite policies are set in place for information and information technology. This is the ultimate case for information/IT policy formulation and the principal argument of all contributory papers. Development plans should include a national information/IT sector plan which should be supportive of the national development plan. This will ensure the relevance of information/IT systems and promote co-ordinated development of sectoral into national level systems or networks that can make information available to users.

D. SCOPE OF NATIONAL INFORMATION POLICIES

a) Broader versus Narrower: The Pros and Cons

The objective of national information policies, stated broadly, is to set the goals, provide the inputs and support mechanism that would make possible the achievement of optimum satisfaction for the information needs of all sectors of the national economy, and to promote effective use of information services. This requires the harnessing and harmonization of all existing national information institutions and functions into an integrated system. On the basis of the definition of information given in ABATE's paper [10] (see Section II), the scope of a national information policy covers the following information institutions and functions: libraries, archives, documentation centres, statistical agencies, the media and broadcasting, telecommunications, publishing, mapping, cartography, land use and geological surveys, remote sensing and meteorology, etc., that is, the different aspects of the provision of actual services to various user communities.

The above would ensure a more comprehensive scope for a NIP. However, the conventional approach and customary references to the formulation of NIPs in African countries demonstrate varying levels of comprehensiveness of content and coverage [18,27,30,37]. There is as yet no comprehensive policy in any of the target countries of the seminar. In those few that have made attempts at NIP formulation, the provisions are limited to libraries and similar institutions and their activities. References in the professional literature to national information policies are to the following areas: (1) discrete processes in the information transfer chain - generation, collection and dissemination; (2) objects of these processes with emphasis on the paper media; (3) the absence of uniformity on what constitute the confines of information (i.e., whether statistical, public administration and management, etc., fall within national information policies or not) [10].

Whatever the controversy or trend exhibited in the literature and current thinking on the subject, some contributory papers and the direction of seminar discussions point to advantages and disadvantages in adopting a narrower or broader scope of national information policies. On the credit side of a broader scope, there is general agreement that (a) the more sectors included in a NIP the greater would be the resources that would be brought to bear on the momentum of policy formulation and implementation; (b) a broader scope would also ensure greater chance of satisfying the total national information needs more comprehensively.

On the debit side, a broad-based NIP will represent a large number of interests which are often competitive and at times conflicting. (a) A broad scope, particularly at the early stage of policy formulation, may jeopardize the chances of success since the process might degenerate into a forum for bureaucratic wrangles and in-fighting. (b) The inclusion of more sectors in a NIP could also create difficulties in the way of co-operative agreement due to suspicion among participant institutions of threat of loss of autonomy to their independence and individual identity. These factors were instrumental in Botswana's decision to opt for a narrowly-based NIP [27].

The general agreement, however is that a broad based NIP should be preferred. This does not necessarily mean a single, common policy, but a conglomerate of sectoral policies which would be well co-ordinated and harmonized. This would also take care of the much discussed problem of fragmentation that bedevils co-operative effort in the information profession. Such a sector oriented policy could also pay closer attention to strategic or priority sectors.

b) Linkages with Other Public Policy Areas

The rate of success of a NIP formulation and implementation depends, to a large extent, on the levels of harmonization and the situation that pertains in those other sectoral and general policy areas with which NIPs have to interface. As noted in Section B.a above, a national information policy, indeed any sectoral policy, should take serious account of the fact that there is interaction between policies operating at any given moment and that such policies may be at variance with and inimical to the success of its own objectives, and vice versa. An indication of the large number of departments, institutions and individuals who become involved in the policy exercise once it is set in motion is described in detail in some contributory papers [10,23,24,25,39].

Some of the most obvious public policy areas that interface with NIPs are one of the topics discussed in ABATE's paper [10]. They include education, science and technology, public and state security, labour and employment, overall economic policy, taxation, transport and communication. A few of these, and the nature of the "interfacing" process, are analysed below:

a) **Education policy**: on the provision of material at all levels of the education system; inculcating in students the reading habit, and the habit of independent, compulsive search for information for problem solving; education and training at all levels for information workers. An example of a positive interfacing relationship is the reduction by the Kenyan Government of the duty on book imports.

b) **Science and technology policy**: on the application of information technology, library, information and documentation services in science and technology research, popularization of science, scientific publishing, and so on.

c) **Public and State security policy**: on confidentiality, individual and national security, individual privacy rights and protection.

d) **National labour and employment policy** is related to education policy. The nature of the former has a direct bearing on the calibre of labour force available. Thus, manpower elements of NIP could be in congruity or at variance with the country's higher education and/or labour policies at large.

e) **General legal system**: The laws of a country provide legitimacy for a NIP and support for its programmes. As demonstrated by several seminar papers [5,8,9,10,15,18,21,24,33]; there also exist various legal instruments such as copyright, deposit laws, laws on publishing, etc., which have a direct bearing on the operation and viability of information services.

f) **Overall economic policy**: A NIP must show keen awareness of national development in its programmes. Hence, for example, the need for sequencing and prioritizing the development of information to coincide with declared national priority areas of development in the provision of information systems and services in the context of scarce resources [15,39].

g) **Taxation policy**: The information/informatics industry is import-oriented. Imported materials and equipment including books, computers and other informatics products are liable to taxation just like any other imported commodities in any sector of the economy. The heavy import levies on such items in the information sector are well known constraints on the sector's development, and are discussed in practically all the country papers. A NIP should be aware of this and establish the necessary rapport with the particular authorities that might evince sympathy or special consideration, as in the Kenyan example cited above.

h) **Communication policy**: Aspects of information transfer rely for success on a sound national communications system. National inter-library loans and associated document delivery systems require an efficient and comparatively cheap postal system to function efficiently, and book mobiles that provide reading material to outreach areas without libraries require good roads. The problem of high cost of communication services such as telecommunications, postal and computer systems that link up international data bases is one that managers of information systems have to contend with.

The above list of policy areas with which a national information policy is likely to interface is by no means exhaustive, but the point is clear: no NIP can succeed if it ignores the implications of other policies on it, and vice versa.

c) The African Experience

There is no full blown comprehensive national information policy in sub-Saharan Africa. The situation at present is a state of flux in which a number of countries have reached various stages in the policy formulation exercise, while others are still seriously discussing taking the plunge. They have all largely come up against the issues discussed under 'scope'. A major problem here is the conventional interpretation or conception of the scope of NIP which is determined by existing definitions of information. As noted already, the seminar participants were almost unanimous in their acceptance of the broader view of information, although, as noted earlier, conventional thinking, on-going NIP activities and references in the literature restrict information policy to institutions that deal with documentary information.

Draft policy efforts of Botswana, Malawi, Uganda, Zambia and Zimbabwe are all library oriented. And this manifests parameters such as the composition of Drafting Committees, information institutions and some policy instruments. For example, the objectives of the 1987 policy seminar in Malawi has been stated as directed towards libraries, documentation and information services [24,30]. Botswana made the deliberate choice of a narrower view in order to concentrate on the development of its library and allied services. Thus, the Report on co-ordinating information services argues:

> a heavy stress on libraries thus implies attaching a preponderant importance to the media of printed information... it means, conversely neglecting or at least de-emphasizing non-print information and operation such as the generation and use of knowledge... The July seminar

> opted in the short-term, for the narrower definition of information and wanted the proposed council to concentrate on the improvement of library and information services and... at a later stage... the council could expand its operation to include other fields of public knowledge and numerical data...[27].

The memorandum on National Information Policy for Zambia presented to Government by the Zambia Library Association (ZLA) "on behalf of the information profession" requests, among other things, the co-ordination and institutionalization of the various information centres in the country which consist only of libraries and related print-based institutions. This is illustrated by the following extract from the document in which the ZLA aims:

> to institutionalise and co-ordinate various information services currently being provided by national institutions such as the University of Zambia Library (National reference activities), National Archives of Zambia (Legal deposit and production of a national bibliography), Zambia Library Service (National lending activities) and NCSR Information and Documentation Centre (Science and Technology focal point) [36].

The literature review [18] mentions Uganda's draft policy which is also unequivocal in its orientation towards libraries, archives and documentation services. Thus, although integrated information policies and systems are their stated objectives, the restricted view of information of the above initiatives robs integration of its implied wide scope. There obviously exist disparate views on the scope of information, and the situation is not helped by the uncertainty as to whether certain types of information identified in definitions of Section A should be covered by a NIP.

This state of affairs led to a long discussion on the limits of information, and possible reasons for the restricted view were advanced, as already noted. It is closely connected with the issue of linkages. Experientially, the problem is the result of insufficient linkages between the different sectors and disciplines of information, even among the library-oriented sectors. All NIP drafts mention co-ordination as a desired result of policy which should be provided through a co-ordinating agency. Its absence is considered as a major weakness in the maximization of resources.

The situation is no better at the institutional level. Linkages with other policy areas are crucial for the success at all levels of the policy process. This is discussed in detail in Section D.b above. The problem here is manifested in the near-total absence of contact between information professionals and policy-makers, researchers and other user groups who are all designated as actors in the policy process. The literature is full of references to lack of contact, especially between information workers and bureaucrats [18]. The former complain of bureaucrats' lack of appreciation of the importance of information as a problem solving tool; bureaucrats are not convinced that their information providers know what they are about; and observers of the scene think that information workers lack sufficient educational attainments comparable to those of the administrators they serve to enable them to establish a viable relationship based on mutual respect [12].

This state of affairs accounts for the fact that the 1986 Resolution of the Ministers Council of the Organization of African Unity (OAU) on the African Informatics Plan for Africa was not known by professionals until it was announced at the seminar. The need to establish a dynamic two-way link with the executive level is stressed, otherwise the policy efforts would get nowhere. It is felt that special efforts should be made to establish viable relationships with all those involved in the policy process. Some participants expressed the view that the policy process itself should bring about contact and sensitivity between the actors involved on the basis of mutual understanding.

The need for a long term solution is undisputed and this should be achieved partly through the introduction of information awareness in the school curriculum in the near future, the same way that consideration of this is being given in certain countries with regard to informatics. Meanwhile, through-thinking is recommended in the policy process. This implies the adoption of processes and procedures that would ensure that communication could be maintained with every level of government.

E. INSTRUMENTS OF INFORMATION POLICY

a) Instruments of National Information Policy and the African Experience

For effective implementation a national information policy must have, at the formulation stage, backing rules and regulations both at the national and sectoral levels that serve as an aid to its enforcement. "It is a prime necessity to formulate and implement appropriate regulatory, legislative and administrative procedures and measures conducive to the sustained growth of the national information system" [6]. These "procedures and measures" are in the form of laws, decrees, executive orders, standards, etc. Some are applicable at certain stages of the policy process while others are essential at all stages.

They are also described as what constitutes policy, and the availability and success of policy is measured in terms of how many of these instruments are in force, how effectively they are applied and with what degree of coherence. As noted below (Section E.b), the target countries already have some of these instruments in force for regulating their information activities, therefore, one cannot speak of lack of information policies in absolute terms. However, the situation is undermined by the absence of coherence and national-level co-ordination in the application of existing instruments. Besides, the instruments in force tend to be limited in scope, and considerable action and changes are required for them to effectively address the problems and developmental challenges that information policies are expected to address. Some of those instruments commonly available to the policy process are discussed below.

Examples of legislation relating to information work are deposit laws, copyright and other printing laws, Acts which set up and regulate the activities of information institutions like libraries, archives and documentation centres, Broadcasting services, statistical departments, etc. They all have major weaknesses including (a) lack of comprehensiveness seen in the exclusion of vital material and areas of activity; (b) absence of clarity in the rules which often leads to misinterpretation and non-compliance and (c) lack of enforcement, to mention only the most obvious. Recent legislative efforts in Malawi [24], Swaziland, Zambia and Zimbabwe may lead to significant amendments and improvements [10].

The impact of budgetary legislation on information work in most African countries is direct and often debilitating. Most African information institutions suffer from indifferent funding and, with the possible exception of some North African countries [5] (especially Algeria and Tunisia), they also suffer from chronic shortages of funds.

Administrative rules, Regulations and Procedures become de facto policies in the absence of formal ones. These include customs duty, import rules, rules on personnel recruitment and placement, and rules telecommunications, etc. They have not been compiled to meet information needs specifically, therefore, they often prove restrictive, even punitive and hence counterproductive. The acquisition of information and information technology materials and equipment suffers from such import regulations whose restrictive approach seems designed to control rather than promote the development of information. Foreign exchange constraints seem to be the main deciding factor in this matter [15,25,32,39].

In Africa, institutions and their terms of reference also tend to become instruments of policy formulation, implementation as well as review. Examples are to be found in such fields as science and technology in general, forestry, tourism, population and desertification. Such institutions play an important role in development because they have the power of policy framework. Their specific though limited mandates tend to amount to policy, in the absence of formal ones. Their areas of weakness are in the overlap of mandates, lack of co-ordination, shortage of qualified manpower, equipment, funds, etc.

On the other hand there are hardly any umbrella institutions with co-ordinating powers over a wide range of information activities or organizations in any African country [10]. The problem of fragmentation of the information discipline into more or less isolated, independent entities is admitted and lamented by all.

The Library Associations (LAs) of African countries have acted as vital instruments of policy in so far as they have been flag bearers of national policies. Evidence in all target countries testifies to this, and other sectors of information recognize, even though grudgingly, the lead role played by the LAs in current information policy exercises in a number of countries of the sub-region [15,24,32]. For example, it was argued in some quarters at the seminar that this lead role is purely accidental, and that the type of information represented by the LAs is narrow in scope; that how seriously the Governments in those countries take the LAs would emerge from their (the Governments') responses to current policy drafts presented to them.

The LAs have responded with the rejoinder that they have attempted to draw some sectors of the information profession into participation in the on-going exercise but have invariably received a lukewarm or indifferent response. Such exchanges during the discussion sessions were a reflection of the serious absence of contact and co-ordination between the various sectors of the profession [40].

Plans, Programmes and Projects are manifestations of policy in practice. They are regarded as instruments of policy in that they lead to a systematic resolution of problems with tangible action, and secure resources required for policy execution. The inclusion of information plans in national development plans has been repeatedly recommended because they are recognized as prerequisites for improving information infrastructures and services. The most basic level of planning will be the project level where the objectives, inputs, outputs and budgetary implications will be spelt out in detail, within a specified time-frame [10].

Like legislation and plans, the form in which information policies are packaged by government is in itself an instrument of policy. Depending on various factors such as a policy's comprehensiveness and length, and the traditional methods employed by a Government, an information policy could be declared through several mediums such as Presidential decrees, executive orders, standards, etc. [6] or, through a "white paper", a government position paper which clearly and exhaustively spells out the intentions of government.

b) No Information Policy in Africa?

A negative response to this question may seem natural, but will not be absolutely true. Bassit's statement with regard to the situation in Arab North Africa also is true to a large extent of sub-Saharan Africa:

> "With the above mentioned concept of a national information policy, and reviewing the available literature; evaluating the relationship between such a policy and national development goals; examining its implications regarding the introduction and use of new technologies (computers, telecommunications); assessing the existing co-ordinating mechanisms in the field of information, one can hardly say that at present there is any national information policy as such in this region. At the same time this does not imply that the region is void from such activities. Actually, as mentioned in earlier stages of this paper there are information services, some of them are even better off than many of their counterparts in industrially developed countries. Others have partial policies covering informatics. Some have already taken the necessary steps moving along the way. Still, the formulation of such a policy is needed for some others and procedures should be set up immediately for this purpose."

Evidence from the literature [18,39] and discussions at the seminar point towards active information pursuits in most of the target countries, although the levels of development and intensity of activity vary from country to country. The inputs from Botswana, Ethiopia, Kenya, Tanzania, Zambia and Zimbabwe endorse this observation. And there are also in force a number of instruments for the implementation of existing sectoral activities despite their recognized shortcomings (see Section E.a immediately above).

In its introductory paragraphs to Section A on National Information Policies, the Kenyan paper [15] admits to the absence of a comprehensive NIP in Kenya but notes that the country "does have several legislations, regulations and guidelines that influence information acquisition, accessibility and dissemination." It goes on to describe the various sectoral services such as libraries, archives, the media services, etc., and the instruments regulating their operations. All the other country papers make similar assertions. Malawi admits that the answer is an ambivalent "Yes" and "No". On the positive side it discusses the various institutions, activities and instruments in place, including the draft policy [24]. On the debit side it points to the absence of a full-blown comprehensive NIP. Its conclusions, quoted below, are a true summary of the situation:

> "To the extent that individual legislative frameworks, supported by funding and staffing, exist in Malawi one could argue that information policies exist. These pieces of legislation have made it possible for institutions such as the National Library Service, the University, the Ministry of Agriculture, the Malawi Bureau of Standards and others to offer meaningful information services to their patrons. Malawi's present policy is therefore the sum total of policies of the various institutions who try to do something on their own, within the limits of the available parental support."

Botswana states that the country is still without "an articulate and deliberately formulated national policy on information and informatics" but is currently examining the need for a comprehensive one. In another paper [8], the existing structures, activities, institutions and instruments in force are enumerated and briefly discussed. Ethiopia and Tanzania follow the same pattern.

As noted above, these countries are all at varying levels of development as regards existing structures, etc., and the stage of on-going policy arrangements. Malawi, Zambia and Botswana have actually presented drafts to government for consideration though it should be noted again that Botswana has opted for a different approach - the creation of a co-ordinating agency which would deal with policy as such. Ethiopia and Zimbabwe have held policy seminars with UNESCO's assistance and the former has established a national information centre (although with a different orientation) - something that those countries that have reached the draft policy/co-ordinating agency state have not done, and Ethiopia is particularly weak where legislation relating to information is concerned [33]. At the same time it can claim some of the most extensive surveys of its resources conducted in an African country. Tanzania can boast of a large number of information services in various sectors of the economy but they operate separate "policies" that are unco-ordinated except within the Tanzania Library Service (TLS) [22]. Other policy initiatives [21] are expected to bear fruit in the not too distant future.

The situation regarding **informatics** is a little more bleak. The discipline is new and therefore infrastructures are not so firmly established. However, as in the traditional information sector, there are different levels of achievement in different countries. The literature review [39] notes that practically none of the target countries has an integrated informatics policy in place. Of all the countries covered, Mauritius has the most systematically documented informatics goals and priorities and has made the most considerable progress towards policy. A special commission on informatics was created among other things, to prepare the 1980 census.

Tanzania has had an interesting experience regarding the development of informatics [23,25]. As noted earlier, a crisis of confidence and relevance in the discipline in the 1970s caused by shortage of qualified manpower and aging equipment led to the imposition of a complete ban on the importation and use of informatics equipment (at least in government) and the return to manual systems. A reversal of this policy occurred in 1987 with increased understanding of the potential of these tools in development. This led to accelerated reorientation and re-establishment of informatics institutions through high level conferences (1987). A high powered Task Force has been formed to consider what government action is required to ensure appropriate progress in the development of informatics.

Zimbabwe, which has been described as over-computerized, does claim a sophisticated level of computer awareness but has no informatics policy, though infrastructure development does not face the type of constraints that are evident in other countries. This is probably due to the fact that the local computer society is involved in a more disciplined manner, and has gone to the extent to provide a code of conduct for the profession with government approval [40].

The Arab countries of North Africa present extremes of development. At the bottom of the scale are countries like the Sudan and Mauritania with very basic infrastructures in the library- oriented sector, with prospects that offer scant hope of accelerated development in the future. At the other extreme are countries like Egypt and Algeria with existing prospects and high expectations of future development [6].

The most encouraging case is that of Algeria where a comprehensive programme of information/informatics policy has been established, based on five-year plans dovetailed into national development plans. An informatics authority - the Commissariat National de l'Informatique (CNI) - has been established since 1962 as a special body for promoting the formulation of information/informatics policy, and supervising its implementation and co-ordination. Areas of progress and development include the establishment of a multi-function medical informatics industry, the establishment of an assembly plant for minicomputers and training courses, all in the context of national five-year plans which ensure systematic (and generous) allocation of funds [6].

Egypt also has a sophisticated system and "has executed high level of preparedness." It has established a national information system - the Egyptian National Scientific and Technical Information Network (ENSTINET) for the promotion of the development of STI. The project, begun in 1980, is a co-operative effort between the Academy of Scientific Research and Technology (ASRT), the Egyptian lead organization on the one hand, and the Georgia Institute of Technology, its American counterpart on the other. It has also presented a draft information/informatics policy to government for consideration. There are plans to establish a National Informatics Centre to provide technical assistance and consultancy, computer software and research facilities [6].

The above demonstrates that the answer to the question posed by this sub-section cannot be unequivocal. Perhaps the observation made by one of the participants is not cynical, all things considered. The absence of policy may well be considered the only consistent "policy".

F. THE INFORMATION POLICY PROCESS AND ITS KEY ACTORS

a) Policy Goals/Objectives

Steps involved in the policy process include:

(a) goal setting,
(b) problem identification,
(c) policy development,
(d) policy implementation, and
(e) policy review.

The limited nature of the African experience in the policy process and the fact that the few attempts are yet to be ratified by the respective governments suggest that only the first three steps, i.e., goal- setting; problem identification and policy development have received attention in the existing literature and were discussed at the seminar. There is need, however, to also discuss the last two steps: implementation and review, in order to provide direction so that the known pitfalls may be avoided and guidelines followed when those stages are reached.

Information Policy formulation or development requires planning boards at every level of the process. The board provides NIP for the country in the same way as Research Councils provide national research policy. Membership should comprise all major users of information and those already involved in information work.

At the planning level, where policy proposals are formulated, the board should usually consist of high government authorities from the various ministries, universities, research establishments, the information industry and from the user sector. They set the goals, respond to suggestions, harmonize conflicting view-points and anticipate the effects of complex interactions.

With regard to these actors involved in the policy process, the general view is that their identities and roles are confused. We talk of professionals, policy-makers and users, but these definitions are interchangeable. Users can be policy-makers and vice versa. Professionals can also be policy-makers and users. Everybody is indeed an actor in the policy process in so far as we are all involved in development. The issue is more one of levels of involvement rather than specific roles as such in the policy continuum. All the levels involve a mixture of these different categories of people, more of one at a particular level than others, depending on the nature of activities associated with that level.

The dimensions of policy objectives are closely associated with the scope of policies. In other words, the broader the scope of a policy the more comprehensive the policy goals get and vice versa. The advantages (and disadvantages) of a broad-based information policy have been discussed already in Section D.b above.

The few examples of African efforts at policy formulation - those of Malawi, Zambia and Botswana - define information policy goals to include:

i. encouraging the generation, collection and utilization of published and unpublished materials;

ii. ensuring support for infrastructure (e.g., telecommunications), facilities, technology and manpower;

iii. encouraging access to and utilization of information in all forms (bibliographic, statistical, referral, etc.);

iv. establishment of a national information and documentation system.

These goals are comprehensive enough to embrace all major information functions [10].

b) Policy Formulation and Key Actors

The formulation stage of the policy development process includes translating the goals and objectives into feasible plans, programmes and projects. Before this can be done, a great deal of information - factual, statistical and descriptive - needs to be assembled on such parameters as finance, manpower and other infrastructural inputs since effective planning cannot be done without the required data, despite the African propensity towards this phenomenon. In other words, there is the necessary first step of problem identification which ideally involves the preparation of detailed analytical surveys on national information needs, infrastructure and services, using systems analysis methodologies. This is described in the Egyptian experience as the systems analysis phase [6]. A number of country papers give a detailed account of the policy formulation process in their respective countries in which the need for accurate and relevant data is emphasized [5,6,8,20,30,37] and hence the need to assemble such data.

Available information on the African experience in this respect suggests that this did not happen, at least not to the desired extent, in the cases of the above-mentioned efforts at policy formulation. Based on the narrow definition of information discussed already, papers of uneven coverage have examined the needs and availability of sectoral library and documentation services and have served as the basis for policy development. Yet professionals have made numerous recommendations for quantitative surveys to be undertaken. It is suggested that the reason why they did not use this methodology may have been due to shortage of time and resources available to them [10].

Surveys of the nature suggested above should indicate that every stage of the policy process requires the close co-operation of departments, institutions and individuals to bring it to a successful conclusion and realization. Information policy formulation or development should therefore involve all the major users of information and those who are already involved in information work. The former group includes bureaucrats, researchers, academics, industrialists, etc. Professionals/information workers comprise, on the basis of the seminar definition of information, statistical and computer personnel, librarians, documentalists, archivists, workers in the media, and in all other fields within the information discipline. Both groups form a broad, multi-disciplinary force whose experience should be harnessed into producing a relevant policy that addresses the needs of all.

In the countries where attempts have been made at policy formulation, however, the main actors have been the library community through the local library associations (LAs). In Kenya, the on-going discussions on policy were initiated by the Kenya Library Association (KLA) [15]. "The Zambia Library Association has been responsible for the elaboration of a NIP in Zambia since 1982" [19]. It is interesting to note, however, that, despite the emphasis on library-related activities and institutions in the policy exercise, membership of the Malawi "drafting seminar" comprised a multi-disciplinary group of experts [30].

As much as possible, attempts were made to include other professional groups, with mixed success. The Botswana group that produced the report on the co-ordination of information services was relatively diverse in composition, comprising librarians, researchers, academics, data processing experts and bureaucrats, and reflect the institutions that have been listed in the country paper as principal actors in the policy process [8,27]. In Zimbabwe, the local LA was the main force behind the promulgation of the National Library and Documentation Service (NLDS), although to a lesser degree, other professional groups participated [9].

c) Policy Implementation and Key Actors

The implementation stage of the policy process involves translating the policy objectives into more specific, problem-oriented, policy statements with an indication of the nature of actions to be taken and the policy instruments to be applied [10]. In simpler terms, this is the stage at which the sub-plans, projects and programmes articulated on the master plan are executed with the above-mentioned guidelines. These policy-statements or plans are based on the outcome of the analyses of data from feasibility studies that, as noted above, should be undertaken at the initial stages of the policy process.

A weakness of the few NIP drafting exercises is that, in spite of the broad policy objectives, the elements, instruments and strategies for implementation deal with library and documentation services only. It is stated categorically in the Zambian presentation that information workers "are the ones who will have the task of implementing the [national information] policy once it is eventually promulgated ..." [19]. However, the author of this document views information professionals in his country as a major obstacle to change and therefore a threat to the success of the implementation exercise.

That information professionals and institutions are the major actors at this stage has expert support. In agreeing with this however, J.P. Polinière's "professionals and institutions in charge of everyday action" are a broad-based group which is assisted in implementing projects by means of the instruments identified above. As has been demonstrated already, however, existing instruments for the implementation process are inadequate, restrictive or ineffectively applied.

External donors are another group of actors at the implementation stage. This stage requires considerable inputs of funds, equipment and qualified manpower. Some of these could be supplied in the form of technical assistance. All country presentations recognize this need but caution against the dependence syndrome which can jeopardize the bid for national self-reliance. External assistance agencies like UNESCO, IDRC, DSE, the Commonwealth Secretariat, to name a few, have been with us for a considerable time. There is a feeling that there has been too much hand-holding already even where this has not been necessary [32]. However, there also is agreement that in spite of this, the assistance and services of foreign donors will continue to be needed. Each country should be left to determine the areas of need and how much aid is required, while keeping a judicious balance between dependency and self sufficiency.

d) Policy Review and Key Actors

The policy process should make provision for the review of existing and newly created institutions and services and the instruments of policy implementation, both new and old, with the intention of revising, endorsing or expanding them. The review exercise is necessitated by the kaleidoscopic changes in the information sector brought about by the rapid advance and the resultant rapid obsolescence rate of IT, and its all-pervasive impact on society. These have created the need to look back and assess whether directions are right, and if they are not, whether change is necessary or whether methods of goal achievement should be improved. Information audits are considered necessary to identify gaps [8].

The key actors here include (a) policy-makers in Government through a co-ordinating board; (b) special interest groups such as subject specialists in STI or an agricultural information service, and (c) Information professionals. For the last-named group, this would also provide an opportunity for self criticism, to find out whether they are doing what they are supposed to do, and whether they are doing it well. In this connection professional associations, including LAs and computer societies, as agents of change and pressure groups, should be involved in increasing awareness and prioritizing the need for NIP, and expectations from it.

The role of user groups in the review exercise is important, because, as target of the services under review, they are in a better position than any other group of actors to contribute towards performance assessment. External assistance agencies may again provide expertise in areas where this is not available locally. The same type of caution as given under implementation is relevant.

G. INFORMATION POLICY ISSUES

a) Centralization and Co-ordination

Central to the crisis of access to development information in Africa by those who need it is fragmentation of existing information services and institutions. Responsibility for libraries, archives and documentation centres and services are spread among several authorities with little or no co-ordination at any level, authorities which tend to compete rather than cooperate with each other. This situation is known to exist in all target countries and was the subject of considerable debate at the seminar. The individual country papers highlight the problem and the literature is full of references to it.

This problem exists at all levels - national, sectoral, institutional and personal. Speaking of the Arab North African countries, BASSIT laments that "the majority [of those institutions] exist, and act completely independently, with no or very little co-operation, harmonization or coherence of action" [6]. Tanzania's experience suggests that the sectoral approach to the development of information has led to the tendency towards self sufficiency (though hardly attainable anywhere) at sectoral and institutional levels [21]. At the personal level, the empire building tendencies of information managers, another dimension of the same problem, is well known. As a result of the above, separate policies exist aimed at satisfying specific institutional and client interests, with little inclination to share available resources.

A similar situation exists in the informatics sector where the literature review notes that practically all countries studied have sectoral informatics policies dealing with one or more issues relating to the sector [39]. This observation is supported by the country presentations on informatics.

At the administrative level, information and informatics institutions are scattered under various authorities which seem to have little to do with one another. It has been noted already that in Tanzania, sectors related to information/informatics are under as many as six ministries and government departments [21,25]. The trend is similar in all the target countries. This absence of co-ordination results in wastage of resources, the presence of gaps in the provision of information and indeed the general inability to meet the demand for information of any named group of users.

Co-ordination cannot be achieved because there are no formal mechanisms for bringing this about, although its desirability is unquestioned. It is in fact considered by all countries (and aid organizations too) as the most effective means of maximizing existing meagre resources at all levels of operation. It is also recognized that a central authority is needed to do this; one established by government, with legal authority behind it to ensure its effectiveness. Such an authority is envisaged as an integral part of the NIP apparatus [35].

Although a central co-ordinating mechanism is considered crucial to the solution of the problems of information availability in Africa, centralized control of information activities does not seem to be acceptable to information practitioners. This view has been strongly expressed in relation to the powers envisaged for the proposed central co-ordinating agencies in the current information policy debate. Most countries prefer that such a body should not have any powers of control but that its role should be merely advisory and "facilitating" in relation to members of the national information networks that NIPs are expected to establish. Thus, Botswana has indicated preference for an agency with "facilitating" powers - a body that will largely advise on, encourage and co-ordinate information activities in the country [27].

The thinking in Tanzania is similar [21]. The Zambian and Malawian drafts also make recommendations along those lines [30,37]. It is interesting to note that although centralisation is rejected at the level of co-ordination, it is encouraged, in fact welcomed at the operational level. This view is supported by various recommendations to establish national documentation centres.

A certain degree of centralization is noted in government operations especially in the informatics sector [25,39]. But this relates mainly to the area of decision-making in the acquisition of IT equipment, largely dictated by foreign exchange constraints. Even this trend is seen as unhealthy because it is considered to be at variance with the development of information technology. The above opinion suggests that in view of the inefficiency of existing data processing (DP) departments, it is advisable that decision-making and authority are more decentralized but properly co-ordinated.

b) Critical Information Policy Success Factors

From goal setting to review, certain factors are recognized as crucial to the success of information policy. The following constitute some of the most critical:

i. A thorough appraisal of fundamental information problems.

One of the reasons why policies in general fail is lack of a clear definition of the problems and goals that are expected to be addressed. It is observed that policy attempts in the field of information have been haphazard and characterized by superficial definition and appraisal of problems, with very few empirical surveys of the problems involved, such as manpower shortages and inadequate training facilities available to meet these; identification of users and their information requirements; attitudes towards information, especially at the policy-making level, and so on. Such an in-depth enquiry provides information which assists policy-makers to decide on precise action.

The literature suggests very little of such activity, therefore, the national information needs that policies are supposed to address tend to be based on estimates and hunches. Botswana, Zambia and Malawi claim to have based their policy drafts on surveys, but their empirical bases cannot be vouchsafed. Two main surveys conducted in the region are associated with international organizations. They comprise (i) the UNESCO-led feasibility study in 1983 of the information infrastructures of the countries of the Southern African sub-region to determine their readiness or otherwise for the Southern African Documentation and Information System (SADIS); (ii) the PADIS Study Team of 1979 which made a similar survey with similar objectives as a prelude to the establishment of PADIS. Among the countries of the sub-region, Ethiopia is the only one which has conducted a comprehensive survey of the information facilities and sources in the country. These activities are recorded in the literature review [18]. An important lesson from the Egyptian experience gained in the course of the establishment of the national information system - ENSTINET - derives from the very scientific manner in which the steps in the NIP formulation process were followed on the basis of systems analysis [6].

ii. Clearly defined objectives.

It is generally accepted that the clearer the objectives that policy is expected to achieve the easier it is to work towards those targets, and the more likely it is to achieve success. This issue is closely related to the scope of policy. Most policy attempts aim at comprehensive, multi-sectoral policy, on the basis of what they have defined as policy goals (see Section F.a above). The objective is to tackle all sectoral policies at the same time. It is suggested, however, that although a broad, comprehensive policy has its advantages, a focused sectoral orientation in support of the prevailing national development priorities stands a greater chance of success [10]. This view is endorsed by the Australian experience cited already, and expressed as "joining the bandwagon of development priorities". The author uses it not appositely, but to question the need for policy [14]. It has been observed, though, that even in the absence of a policy, the application of informatics will experience success if it coincides with priority areas. Examples are cited from Zimbabwe [39].

In Mauritius, informatics goals and priorities have been made to coincide with areas of government priority development such as Tourism and the Sugar industry. Kenya has also proposed the establishment as priority sectors agriculture, industry, health and planning on which to focus information development to ensure success [15].

iii. Awareness of the importance of information in socio-economic development.

Much has been written and said on this topic in relation to African bureaucrats. The criticism is mainly from information professionals. Thus, all the country papers at the seminar have reiterated it as a stumbling block to the development of information.

The need to sensitize this group of users is stressed and rests on the fact that as they promote policy formulation and provide funds, they can block the progress of policy if they are not convinced of its relevance. The onus lies on the information profession to change this state of affairs. Self criticism by the profession is advised as a healthy exercise but it has proved more difficult to engage in this, and easier to apportion blame.

iv. Coherence within subsectoral information policies and between information policies and other national policies.

Although there are no comprehensive information policies in any country in Sub-Saharan Africa, sectoral policies already exist in practically all these countries. What is lacking among them is coherence. The situation manifests itself as isolationism, lack of co-ordination, and lack of cooperation, all of which militate against performance. At the national level, information policy, like any other policy, has to interface with many other national policy areas. Recognition of the need for and the level of success of this interface determines policy success. These issues have been discussed under Section D.b above.

v. Efficient system of implementation and follow up.

This is important to policy success and depends on several factors among which is the need to have in place an efficient system of enforcement. Some of the various instruments available for enforcing policy have been described under Section E.a above. There are many in force for regulating the largely sectoral activities of individual information services. The problem is that they are either not enforced, or that enforcement is ineffective. Another relevant agent of enforcement is trained and qualified manpower which is keenly alive to its responsibilities generally, and which is particularly aware of the fact that it carries on its shoulders the responsibility of being the major implementor of policy. Severe manpower problems threaten the effectiveness of professionals as agents of enforcement. The manpower problem is analysed in detail immediately below (Section G.c).

vi. Continuous feedback and review.

These are necessary exercises during and after implementation, as has been observed above (Section F.d). Monitoring, or evaluating during implementation ensures consistency between the objectives and what is actually happening. It is important to check regularly to see whether targeted goals are being achieved. Assessment after implementation or ex post assessment determines, among others, what goals were actually realised in comparison with the set objectives. Though there are no full blown information policies yet in the region, existing sectoral and institutional services require such a spotlight. This should be done through proper evaluative mechanisms-definite systems of performance review and user surveys. There is insufficient evidence that these are being done, as noted already (Section F.b).

c) Human Resources Development

A critical constraint on various development efforts in African countries is the low level of development of their human resources. From the point of view of information, these include not only the workforce but also the user community. Not only are information workers deficient in most of the requisite information skills, but also the various groups of users they serve lack the training and habit to use purposefully the available information. This twin problem was brought into sharp focus at the seminar.

The lack of adequately trained and qualified information workforce is considered by one country paper as the greatest weakness within the information services [21]. This view is endorsed by the UNISIST Guidelines [35]. The weakness is related to the nature of existing training facilities and their responses to the manpower problems which manifest themselves in the following ways:

i. Africa-based training opportunities are limited;
ii. those available are oriented towards the traditional information services and institutions;
iii. there are no retraining facilities for both professional and non-professional personnel [10].

The existing workforce is almost entirely trained to staff libraries, archives, and documentation services only. Even in this sector the ratio of professionals to non-professional staff is skewed badly in favour of the latter in most of the participant countries. This conclusion is supported by the findings of a recent survey of training institutions in the sub-region which points to a growing trend to over-produce non-graduate diploma holders many of whom fill professional positions and perform tasks which their training and skills do not equip them to perform efficiently [26].

In Tanzania, for example, holders of the two-year diploma in librarianship are considered "professional" in non-academic libraries [21]. Worse still, their conceptualization of their role as caretakers, and their junior status in the bureaucratic and decision-making hierarchy, give a poor image of the role of information in planning and development, and deprive the profession of the strong lobby of confident professionals that can argue its case.

There is concern that the information profession in Africa should not be limited to the training merely of librarians and archivists, but that it should also concern itself with equipping them with management skills and strengthening their leadership capacity so that they can play a political role in defence of policy [10]. To achieve this, their educational attainment should be made comparable to those of the administrative and technical, research and academic personnel for whom they provide information services; and their status and remuneration should equally be elevated. This calls for a reorientation of existing training institutions or the establishment of new ones that can meet the urgent demands of the emerging information systems and technologies for specialist, "all purpose", information managers [13].

In the IT sector, the picture is equally, if not more dismal. Practically all the target countries of the literature review report acute shortages of trained manpower at all levels [39], with the single exception of Zimbabwe which is self-sufficient in computer maintenance engineers [40].

There are slight differences in the seriousness of the situation. Lower down the scale are countries like Malawi where qualified personnel is scarce both in government and the private sector, and which reports the shortage of people with the requisite computer knowledge to undertake simple computer installation and maintenance [24]. Tanzania, where some active effort has been made to address all aspects of the IT problem, also reports similar shortages in government and the private sector, adding that the proliferation of IT equipment is hardly matched by qualified manpower [25].

There is an acute shortage of training facilities for all levels of informatics professional in most of the countries. Tanzania reports proliferation of short and long-term courses in the private sector since 1985 [23], but all at the elementary level. These, however, are unco-ordinated and there is little government control over the curricula, examinations and certification in these institutions. The situation jeopardizes the employment prospects of students for whom no employment opportunities are assured. The long-term, disastrous consequences of this situation has been stressed. In Malawi, the University of Malawi is the only institution which provides "formal" but composite training in informatics vis-a-vis a growth rate of 10-12% per annum of informatics equipment, an obviously inadequate provision to meet this high growth rate. The government data processing department provides courses in computer awareness and in-service training for civil servants. The Computer Society of Malawi, described as "young, weak and not very effective", provides short courses and seminars [24].

In Botswana, the education and training of IT personnel is in the hands of a number of institutions including the University of Botswana, but no degree courses are offered [8]. The government obtains training for its personnel by means of a co-operative arrangement with South Africa which requires sending personnel to that country for training. The arrangement is considered unsatisfactory [16]. Educational institutions have had no significant impact in Zambia, although as far back as the early 1970's, an institute of technology offered courses at certificate level. This was discontinued. Of late, a college offers two to three years computer studies with the assistance of a donor agency. The country's computer professionals and computer society were actively involved in the curriculum design [32]. Zimbabwe again offers a more attractive picture. Computer education is available at the university level, and the Government has plans to introduce computer studies in schools. Polytechnics also offer small, part-time courses. The lead position of the computer society here is seen in its provision of a professional code of conduct for training institutions [40].

Co-operation is considered necessary in the provision of training facilities for the information profession in the African region generally. PADIS is seen as representing the symbol of such co-operation. The assistance of external organizations in this regard will continue to be relevant, and the current arrangement to set up a School of Information Science for Africa (SISA) in Addis Ababa University with the assistance of IDRC and other donors has been noted with appreciation.

As observed above, human resources development does not relate only to the training of information personnel who provide information; it should also include the education of actual and potential users to enable them to make effective use of the information available [16]. That this is lacking is seen as a demand constraint the root causes of which may not be straight-forward illiteracy. They are also attributed to the fact that the reading habit and the impulse to use information are not developed, even in institutions of higher learning [10]. There is less training in individual problem-solving and in the use of various information resources. Increased user awareness through surveys and a user training drive is seen as the only solution. It seems that capacity utilization in Africa's information services has proved a more intractable problem than capacity building.

d) Role of Information Technologies in African Development

It is now widely accepted that ITs have an important role to play in the socio-economic development of African countries. For one, there is general recognition that effective information processing is a *sine qua non* for more cost effective management [39]. Practically all African countries have embraced the IT revolution because of its potential for development and as a powerful agent for technological and social change. This is already beginning to manifest itself in the ways in which governments and companies work in a number of African countries.

In spite of, or maybe because of this great potential, there is cause for concern that most countries of the region have not yet demonstrated the sound ability to effectively harness this technology for full integrated development (see Section C.c: Planning). There is an obvious absence of clear conception of how this integration should be affected. Thus, the advances in IT present both an opportunity and a threat to developing countries, especially, in Africa.

A two-fold threat is recognized. Firstly, as beginners or late-comers in the IT revolution, developing countries are in no position to compete with their technologically developed counterparts in the international market place. Secondly, participation in the IT revolution by developing countries represents a major technological leap and a force of major social change. Both processes need to be controlled so that they do not get out of hand [10]. The application of the new technology is characterized by a new information culture dominated by computers in all areas of human endeavour. This has given rise to new demands which African countries must meet, whether they like it or not, especially in order to relate to the developed world.

The main problems that inhibit effective application have been discussed in detail by ZWANGOBANI [38] in his contributory paper to the IDRC African Strategy Seminar of 1987. They are presented here only in main headings as lack of funds, especially foreign currency; shortage of skilled personnel; inadequate training facilities; inadequate and inefficient telecommunication services; lack of professional bodies or societies; inadequate industrial base; and lack of political direction. These problems need to be addressed urgently and quickly if African countries are to reap the full benefits of the new technologies.

The levels of IT applications in African countries are measured against a number of existing classifications. UNESCO, for example, recognizes four levels, categorized as initial, basic, operational, and advanced. These correspond roughly to the three-phase classification presented in the Zimbabwean and Tanzanian country papers on informatics policies respectively as Phases I, II and III [40]; and as Operational, Tactical and Strategic Planning [25] Levels. The Commonwealth Secretariat report also identifies five levels which include (a) data and transaction processing systems; (b) operational and management control systems; (c) sectoral information systems; (d) multi-sectoral information systems, and (e) planning and policy systems [16].

Most countries of the region hardly rise above the basic - the second of UNESCO's four levels. The average is estimated to fall somewhere between the basic and the operational [39] which would be close to Phase II or the Tactical Level, according to the Zimbabwe and Tanzania classifications. The largest level of applications is commercial data processing such as payroll, accounting, invoicing etc., described as "bread and butter applications" [39]. These graduate (but in inverse proportion) into management information applications such as, planning, project control, modelling, simulation, etc.

Experiences in the various country presentations on informatics also support the above observation. In Tanzania, for example, applications are largely commercial and generate a lot of information for operational staff. Management information applications such as census data, hydrological surveys, statistics, etc., which have significant influence on decision-making, are hardly touched. While some information is achieved for the Tactical level, (Level II) there is almost no service at the top management or Strategic Planning Level of management (Level III) and therefore little impact on decision-making [25]. Mauritius is the only country in the sub-region which tries to apply computer technology in national development through judicious prioritization of sectors to computerize [39].

The pattern in Zambia is similar to that in Tanzania. Most installations are the usual commercial type, but notable tactical level applications include the mining corporations computerized vehicle movement control system at the large open pit division, the primary school examination, the electoral roll and the budget control systems in government [32]. In Zimbabwe where the Government is the largest user of informatics products, and where computerization has developed at a much faster pace, applications are reported to be at Phases I and II, especially at Phase II of the country's 3-phase categorization.

The Commonwealth Secretariat report also finds the commercial mode of application as the most predominant category of application in English-speaking African countries (which were the target of its survey), and as one of the first applications to be computerized [16]. This report provides a rather more comprehensive, in-depth survey of the status of IT in those countries. Thus, it also records an increasing variety of applications even up to management/policy levels, though the latter category is fewer.

The report provides information on a number of major areas of computer applications that are perceived to have a high national development impact, and which have been operational for some time. For countries of the East and Southern African sub-region, these include, beginning with data and transaction systems, the Malawi Foreign Trade Statistics Information System, Zambia's Grade VII Examinations System cited earlier, Botswana's system for marriages, births and deaths and Zimbabwe's Voters Registration system. Operational and management control systems include, among others, the Mauritius Sales Tax system, Botswana's Fuel Control System and the Kenya Wagon Control System.

A variety of impacts are shown as resulting from these and other IT applications in governments of the sub-region. A summary of these impacts is given in Table I. Data transaction processing systems have had significant impacts. Examples include the Tanzania Household Budget Survey System and Botswana's Continuous Household Income and Production Survey System which facilitate the production of more accurate statistics as well as generating information that government agencies can use to formulate sectoral policies. Malawi's Foreign Trade Statistics system permit interdepartmental co-ordination, in addition to the production of timely statistics and monitoring of the status of external trade. The Zambia Grade VII Examination System and the Botswana Primary School Leaving Examination System permit faster processing of examinations, centralisation of examination marking and streamlining the selection of secondary school candidates. More significantly, these systems enable examination marking and selection of candidates to be done on fair and impartial basis. And the Zimbabwe Voters Registration System represents not only an efficient record keeping systems, it also reduces the incidence of multiple registration for voting.

National level Operational and Management control systems streamline operations and management activities, resulting in cost-savings, improved revenue generation and efficient resource utilization. Thus, the Mauritius Sales Tax System improves revenue collection to the tune of some US$20 million per annum, and Botswana's Income Tax Collection system which centralizes the collection of income tax and payment of rebates for the whole country ensures an efficient process.

Organisational-level systems such as the Botswana Fuel Control System of the Central Transport Organisation (CTO) and the Kenya Wagon Control System of Kenya Railways streamline operations and enable management to reduce operating costs and increase capacity utilization.

The areas of impact relate also to types of infrastructure support, and to what extent these are operational in a given country. Besides computers, these include among others, telecommunications and electricity. IT in the mass media and telecommunications sector is dominated by developments in the last-named sector. Most countries have seen a high level of influence and innovative development in this sector, a fact that has led to its assumption of the role of a standard setting sub-sector in the informatics sector. Kenya [15] has experienced the most tremendous studies in the application of IT in this field. This is reflected in its advanced telephone and satellite communication systems. Yet most libraries and documentation centres are not computerized except those established by international/external organizations.

Tanzania [25] also has a reasonably comprehensive telecommunications network serving national, regional and international needs, but the facilities are underutilized and their development potential unrealized. Teleprocessing is only utilized by Air Tanzania Corporation (ATC) for passenger reservation and ticketing, although other institutions are said to be planning similar facilities. The telecommunications sector in Malawi also dominates the support sector, but available evidence suggests that innovation here tends to have a rather negative effect on existing services, even though the long-term advantageous effects are recognized [24]. The main reason is finance. The new facsimile service has adversely affected telex service sales: it is cheaper for the user but brings in less revenue to the Department than telex sales. Therefore the Department is hesitant in using it. Government intervention is recommended to ensure user orientation and less emphasis on company profits, so long as a new system is cost effective. The Department continues to monitor the country's needs, nonetheless, and imports new equipment. Data communication facilities have been installed but are weak at the moment and therefore not considered helpful in transmitting data in the country. Satellite communication is also being developed: remote sensing facilities are available for weather forecasting in the Meteorology Department and the Land Husbandry Branch of the Ministry of Agriculture.

The trend in Zimbabwe also reflects the dominance of the telecommunications sector. The latter exercises control over its models, and has established a standard of excellence in innovative development. Permission is required before any communication devices can be installed onto their communication network, and these should conform strictly to their performance standards [40].

The above is ample evidence of the increase in the application and the beneficial impacts of ITs on countries of the East and Southern African sub-region. It has been noted above that certain problems inhibit the realization and utilization of the full potential of these technologies. There is no doubt, however, that their importance as the gateway to economic development in this information age is recognized.

A major conclusion is the need for national-level planning co-orindation in IT development [16]. Some forms of mechanism for co-ordination do exist already in most of these countries. For example, Botswana has a Computer Steering Committee in the Ministry of Finance; the Cabinet Office of Zambia houses the Computer Utilization Committee (CUC); Malawi's Data Processing Department (DPD) is located in the country's Ministry of Finance. However, their co-ordination functions are limited largely to decision-making regarding the acquisition of computer hardware. The need to relax the tendency towards control in the interest of promotion in the utilization of the potentials of existing equipment and systems has been expressed.

H. CONCLUSIONS AND RECOMMENDATIONS

Thorough discussions that followed the presentation of the various country and commissioned reports resulted in specific conclusions and recommendations on two main themes: (a) Information policy and the parametric factors and instruments necessary for its success in all stages of the formulation process, and (b) Major actors in the information policy process and their roles.

a) Information Policy

i. Definition for Information and Informatics

Information is a broad, inter-disciplinary sector. However, there is no common definition for it. This is confirmed by the disparate nature of existing definitions. They are lacking in comprehensiveness, being largely oriented towards documentary information. Besides, there is lack of agreement among information professionals on the limits of information. However, in order to establish the domain of information in the context of the seminar, a practical, development-oriented definition was considered necessary. Such a definition and one which encompasses the various sectors, institutions and their activities has been adopted and is recommended as cited above (SECTION B.b in the text).

As regards informatics the term omits reference to certain pertinent technologies. In the context of policy, the term information technologies was considered preferable. The seminar opted to focus its discussions on all information technologies. It was recommended that information technologies should be defined as "the application of modern, new tools and techniques to the acquisition, processing (including storage, repackaging and dissemination) of information".

On the relationship between information and information technologies, the conclusion is that there is a natural unity between the two terms which is reflected in the ever-increasing integration of ITs in most areas of national life including telecommunications, computers, publishing, resources inventory, early warning systems, etc. One of the main reasons for an information policy is that information technology is advancing so fast that, as noted already, it has raised certain issues and problems that need urgent attention.

ii. Scope of Policies

National information policies could be broad or narrow in scope. However, Governments could derive major advantages from setting broad policy objectives that will accommodate the varied national information activities and institutions. This may be difficult to achieve in the short term due to the large number of interests and other issues involved. Another option for Governments is to develop partial policies for subsectors within the information sector. There is a third alternative for Governments which may choose the second approach, i.e., they can develop information policies for particular priority sectors of their economy, such as agriculture. Information priorities in African countries may vary but the establishment of national information systems and the development of information infrastructures are considered a priority. It is recommended that the particular combination of circumstances in a country should determine which type of policy to adopt. The policy and systems adopted should be in consonance with national development priorities. In order to ensure this, it is recommended that priority areas in the development plan should be identified and emphasized in the information plan, bearing in mind the sequencing or prioritizing of these areas.

iii. Policy Areas

On the basis of the discussions on the seminar papers, the following were identified as some of the major areas that a policy should address:

(a) National Information Sector
(b) Utility of Information
(c) Information Technologies and Products
(d) Management of Information Resources
(e) Information Services Industry
(f) Information Sector Manpower
(g) International Information Activities
(h) Rationalization of Purchase of Equipment
(i) Standardization and Compatibility
(j) Value System and National Interest

iv. Policy Instruments

A number of instruments were identified as some of those commonly available to information policy processes. These have been discussed in Section E.a above. Ideally all these instruments should be optimally utilized in a coherent manner to ensure the success of policy. It has been established that one or more of these policy instruments is in force for regulating information activities in most African countries. Therefore, one could not talk of lack of information policy in Africa in absolute terms. However, the inefficiency, inconsistency and lack of coherence in the application of these instruments can and do constitute lack of policy. In addition, the instruments are inadequate in the scope, degree and nature of changes and actions required to overcome the fundamental problems and developmental challenges that information policies should address.

It is therefore strongly recommended that at the time of policy formulation, Governments identify the appropriate instruments necessary for each policy objective. Where instruments for a particular policy objective are already in place, the policy being prepared should make provision for their review with a view to revising, endorsing and/or expanding them.

v. Critical Policy Success Factors

Certain factors were identified as critical to the success of the information policy process (from goal setting to review). They have been identified and discussed in Section G.b above.

vi. Co-ordination

The nature of co-ordination is determined by the scope of policy. In general, at the national level co-ordination of information work should take the form of facilitating the policy process; harmonization; standardization; and, interfacing. This could be usefully supplemented by a more structured co-ordination within the respective information subsectors and by applying judicious measures of centralization and decentralization.

With regard to information technologies, at present, Governments seem to favour a centralized approach to (a) the making of decisions regarding information technology acquisition; (b) the provision of information technology resources and services (i.e. through the Government computer centre or Data Processing Department (DPD).

In discussing the issue of centralization versus decentralization, it was noted that each approach has its own advantages and disadvantages. The nature of the advances in IT, with decreasing costs of acquisition, seems to favour decentralized application. However, it is felt strongly that each government concerned should be left to adopt any of the two approaches on the basis of the prevailing circumstances.

Discussions have demonstrated that it is not possible to talk about information policy without reference to other national policies. Two main levels of linkage have been identified: inter-sectoral and intra-sectoral. Linkages between the information sector and other sectors of the national economy could be brought about through an inter-ministerial council or such high-powered body. With reference to intra-sectoral linkages, the formulation of a cohesive national information programme should ensure this.

b) Main Actors in the Policy Process

Policy formulation is usually the domain of Government. However, with regard to information policy, professionals have taken the initiative and have demonstrated that they also have an important role to play in the exercise. User groups including researchers, academics, other professionals and the private sector also have a role to play since all are involved in the task of national development. The involvement of the private sector is particularly stressed because of its experience and vast but little known information needs. Co-operation between these groups is generally encouraged to ensure effective policy formulation, implementation and review. The assistance of external aid agencies will also continue to be required by African countries in information policy formulation, as in other sectors especially in the areas of funding and technical assistance. However, African countries should not lose sight of the need for self-reliance.

The role played by each of these groups will differ at various stages of the information policy process, but the role of government/policy makers and information professionals pervades all stages. Certain specific recommendations are therefore addressed to these two major actors in the policy process. Government in recognition of its role as source and prime-mover of policy, and professionals as main implementors of policy.

i. Government

The role of government in information policy formulation includes, among others (a) Providing the necessary legislative, institutional, financial and infrastructural mechanisms for the formulation, implementation, enforcement and review of policy; (b) establishing a body or using an already existing body charged with the responsibility for policy formulation; (c) Formulating a plan which should be included in the national development plan, and generally creating an environment that would promote the formulation and implementation of policy. For the above reasons, it is recommended that:

(a) in view of the rapid advances in information technologies their societal impact and their impact on national development, the formulation of national information policies be speeded up so that these parameters can be properly assessed and controlled;

(b) in view of the common level of development among countries of the sub-region and the similarity of problems encountered in harnessing information technology, regional co-operation be actively pursued in all areas of information development, including manpower development; standardization of training programmes in information technology; formulation of regional policies; development of telecommunication facilities (including satellites); standardization in appropriate areas of information technology, etc. In this connection, initiatives like the proposed School of Information Science for Africa (SISA) at Addis Ababa University as a regional education centre is highly commended;

(c) steps be taken to ensure adequate and appropriate development of manpower for the information sector with particular attention to the managerial level. As a prelude to formulating strategies for the achievement of this objective, a survey should be conducted to gather data on trained/skilled manpower requirements of the information sector, and on training resources available in the country;

(d) governments give sufficient attention to ensuring that the national education system, at all levels, is kept up-to-date in respect of advancement, through appropriate curricular changes/reviews, and the retraining of teachers to prepare the next generation of information practitioners and users;

(e) in order to increase the awareness of information technology in the population and to sensitize it to the need for using accurate and up-to-date information in decision-making, the inclusion of information related activities, and information technology courses be considered throughout the national education system, as far as possible;

(f) recognizing the need to have national information policies integrated with development policies and plans of the country, the active involvement and participation of special interest groups, for example, Non Governmental Organizations (NGOs), user groups, and professional associations in the process of policy formulation, be sought and encouraged;

(g) in view of the important role played by the private sector in the generation, procurement, dissemination and utilization of information, government be invited to take into consideration the participation of this sector in the process of policy formulation, implementation and review;

(h) recognizing the fact that external aid agencies will continue to play a relevant role in the policy formulation exercise, (a) African countries should determine the level and types of assistance, and when this should be given; (b) external aid agencies could provide technical assistance in the formulation and implementation of national plans in the form of the establishment of formats, norms, standards, guidelines, etc. This is with particular reference to the new area of the development of a Pan African Information System or data base pertaining to national policy, legislation and so on, whose primary objective would be to provide exposure for policy-makers as well as information professionals. Furthermore, (c) African countries should not lose sight of the need for self reliance, in spite of the above.

(i) As a corollary to h) above, the policy formulation as such should be the responsibility of the nationals of a country. This principle should be strictly adhered to, to ensure that the ultimate policy objectives will be relevant to national needs.

ii. Information Professionals

The term "information professionals" was defined broadly to include librarians, archivists, documentalists, information scientists, extension workers, journalists, publishers, computer scientists, systems analysts, software engineers, programmers, data entry operators, statisticians, mapping specialists, film producers, etc; that is, those who are involved in the generation, processing and dissemination of information. The policy formulation process would be more effective if their involvement in it was enhanced. The integration of professionals and the government was necessary to ensure effective policy formulation, implementation and review. To ensure all of the above, it is recommended:

(a) that information professionals, as agents of change, should strengthen their associations/societies and make them more effective representatives of the profession so that they would be enabled to engage in such professional roles as developing standards on training, software, etc., and developing codes of conduct for their membership; engage in aggressive marketing of their services; create awareness of new developments in information technologies among their members and user communities, and act as pressure and lobby groups for the profession;

(b) professional bodies should co-operate with each other at the highest levels in order that they could adopt a uniform approach to national information policy issues, and thereby strengthen their relationship with Government;

(c) professional associations should be formed where none exist. Those that exist already should mobilize their membership and be generally seen to be active representatives of their various professions at the local, national and international levels.

TABLE 1 : THE IMPACT OF INFORMATION TECHNOLOGY APPLICATIONS IN GOVERNMENT

APPLICATION (YEAR IMPLEMENTED)	IMPACT
Botswana fuel control system (1982)	Tracking government vehicle movements and efficient resource reduction
Kenya Wagon Control System (1971)	Better fleet control and congestion reduction
Malawi Foreign Trade Statistics System (1966)	Monitoring status of external trade
Mauritius Sales Tax System (1983)	Fast processing of sales tax data and efficient revenue collection
Tanzania Government Household Budget Survey System (1975)	Fast processing of nation-wide survey data
Zambia Grade VII Examination System (1969)	Fast processing of secondary school examination results and streamlining candidate selection
Zimbabwe Voters Registration System	Clean voters roll and elimination of multiple registration

Adapted from: Mohan KAUL and Han Chung KWONG, eds. Information Technology in Government - African experiences, London: Commonwealth Secretariat. Preliminary edition, June 1988.

I. REFERENCES

1. ADAMS, Scott and WERDEL, Judith A.
Co-operation in information activities through international organizations. Annual Review of Information Science and Technology Vol.9, 1975.

2. AIYEPEKU, W.O.
Information utilization by policy-makers in Nigeria, Part IV: Critical factors in the utilization of information. Jrnl. of Info. Sc. 5 (1982) 89-92.

3. AUBRAC, Raymond
National information policies as discussed in UNESCO literature. [Ottawa, Ont.: Confidential IDRC document], 1988. 29p.

4. BACKGROUND Information and guidelines on the preparation of the country papers [by the Seminar sponsors; PADIS and IDRC]. Addis Ababa, April 1988. 12p.

5. BAFFOUR-AWUAH, Margaret.
The information policy situation in Botswana: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov - 1 Dec 1988, p. 8 (PADIS/ECA/SEC/III/12/15.

6. BASSIT, Ahmed A.
Experiences of North African countries in formulating national information policies: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics policies in Africa, Addis Ababa, 27 Nov - 1 Dec. 1988. 15p. (ECA/PADIS/SEC/III/ 12/6).

7. BOADI, B.Y. and HAVARD-WILLIAMS, P.
Legislation for library and information services in Anglophone West Africa. Libri: International Library Review, Vol.33, No.1, March, 1983. pp.9-21.

8. DATTA, Ansu.
National Information and Informatics Policy: the case of Botswana: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 18p. (ECA/PADIS/SEC/III/12/11).

9. DUBE, S.R.
National Information Policy in Zimbabwe: a practitioner's point of view: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 15p. (ECA/PADIS/SEC/III/12/2).

10. ECONOMIC COMMISSION FOR AFRICA. Pan African Documentation and Information System. Issues pertaining to National Information Policies in Africa by Dejen Abate, ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Polices in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 36p. (ECA/PADIS/SEC/III/12/14).

11. ECONOMIC COMMISSION FOR AFRICA. Socio-Economic Planning and Research Division. Planning, Information and Informatics: ECA/PADIS/IDRC Seminar on National Information and Informatics Policies in Africa Addis Ababa, 27 November - 1 December 1988 5p (ECA/PADIS/SEC/III/12/16).

12. GEHRKE, Ulrich.
Information for development. Some problems of national co-ordination, regional co-operation and international assistance, INSPEL: Official organ of the IFLA Division of Special Libraries, No.3, pp.166-193.

13. GRAHAM, Garth.
Programme directions of IDRC Information Sciences Division. In: Manpower Training needs. Proceedings and Papers of the Information Experts Meeting, 18-21 March, 1985. Edited by Lutz Huttemann. Bonn: DSE, 1985. pp.137-149.

14. JUDGE, Peter.
Questions of National Information Policy: Guest Editorial Jnl. of Info Sc. 14 (1988) 317-318.

15. KARIUKI, Mainu [et al.].
National Information and informatics policies in Kenya: country paper. ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 40p. (ECA/PADIS/SEC/III/12/9).

16. KAUL, Mohan and HAN Chun Kwong, eds.
Summary: Information technology in Government, the African experiences: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 1.20p (ECA/PADIS/SEC/III/12/4).

17. KAUNGAMNO, E.E.
Problems and solutions in setting up library and information services in a developing country - the case of Tanzania: Paper presented at the Commonwealth Library Association (COMLA) Seminar, 24 Feb - 2 March, 1983. Nairobi, Kenya. 1983. 30, 2p.

18. KISIEDU, Christine O.
A Review of sub-Saharan African Literature on national information policy: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 85p. (ECA/PADIS/SEC/III/12/10).

19. LUNDU, Maurice.
National Information Policy Formulation process in Zambia since 1970: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 17p. (ECA/PADIS/SEC/III/12/5).

20. LUNDU, Maurice.
Policy-Makers' views on information/informatics policy: the Zambian experience. ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 7p. (ECA/PADIS/SEC/III/12/2).

21. MASCARENHAS, O.C.
National information policy in Tanzania: a practitioner's view: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 16p. ECA/PADIS/SEC/III/12/12).

22. MCHOMBU, K.J.
Development of Library and documentation services in Tanzania: problems of strategy and tactics. Information processing management, vol.20, No.4, pp.559-569, 1984.

23. MLOLWA, R.N. and SAWE, D.
Policy-makers' and planners' views on information/ informatics policy in Tanzania: ECA/PADIS/IDRC Regional Seminar on Information and informatics Policies in Africa. Addis Ababa, 27 November - 1 December 1988. 21p. ECA/PADIS/SEC/III/12/13).

24. MWIYERIWA, Steve S. and MASANJIKA, Ralph
A country paper: Malawi, ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 29p. (ECA/PADIS/SEC/III/12/1)

25. NDAMAGI, Chris.
National informatics policies in Tanzania: a practitioner's view: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 35p. (ECA/PADIS/SEC/III/12/19)

26. NEIL, J.R.
Library Manpower planning in Southern, Central and Eastern Africa. *In*: Manpower Training needs. Proceedings and papers of the Information Experts Meeting, 18-21 March, 1985. Edited by Lutz Huttemann. Bonn: DSE, 1985. pp.19-28.

27. A REPORT on Co-ordinating Information Services in Botswana. Prepared by the Drafting Committee. Gaborone: Information and Documentation Committee, 1988. 56p.

28. ROBERT, Kenneth H.
UNESCO's GENERAL INFORMATION PROGRAMME, 1977-1987; its characteristics, activities and accomplishment. *Information Development*, Vol.4, Oct. 1988. pp.208-238.

29. SAMUELSON, Kjell, BORKO, H. and AMEY, G.H.
Information Systems and networks: Design and planning guidelines of informatics for managers, Decision-makers and system analysts. Amsterdam: North Holland Pub Co., 1977. 148p.

30. SEMINAR on National Policy on Library and Information Services, Lilongwe, Malawi, 4-6 March, 1987. Report Edited by Steve Mwiyeriwa. Lilongwe: [National Library Service, Malawi], 1987. 70p.

31. SEMINAR on Resource-sharing in Southern and Central Africa, Dar es Salaam, Tanzania, 16-19 Dec. 1985: Final Report. Paris: UNESCO/PGI, 1986. 15,3.3p. (PG3-86/PPS/Tanz/2; PGI-86/WS/8).

32. SHITIMA, M. Ndhlovu.
National informatics policies: a practitioners point of view: Zambia: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 13p. (ECA/PADIS/SEC/III/12/3).

33. TEFERI Kebede
National Information Policy: The Ethiopian experience: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 16p. (ECA/PADIS/SEC/III/12/17).

34. UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANIZATION
Inter-governmental Conference on Scientific and Technological Development, UNISIST II, PARIS, 28 May- 1 June, 1979. Main Working Document (Annex 1: Glossary) Paris: UNISIST/PGI, 1979.

35. WESLEY-TANASKOVIC, Ines.
Guidelines on national information policy: scope, formulation and implementation, prepared by Mrs. I. Wesley-Tanaskovic [for the] General Information Programme and UNISIST. Paris: UNESCO, 1985. xiii, 40p. (PGI-85/WS/14).

36. ZAMBIA LIBRARY ASSOCIATION (ZLA)
Memorandum on National Information Policy for Zamiba presented to the Chairman of the Social and Cultural Sub-Committee of the Central Committee of UNIP by the Zambia Library Association (ZLA) on behalf of the information profession in Zambia... [1988] 10p.

37. ZAMBIA LIBRARY ASSOCIATION. (ZLA)
National Information Policy for Zambia: Draft Proposal [by the ZLA Working Party on National Information Policy. Lusaka: ZLA, 1987]. viii, 28, 2p.

38. ZWANGOBANI, Elliot.
Information tools and techniques. Harare, March 1987. [unpublished] 43p. (Prepared for the IDRC Seminar-Information Science: An African Strategy, pp7).

39. ZWANGOBANI, Elliot.
Review of literature on informatics policy in selected African countries South of the Sahara: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 27 Nov. - 1 Dec. 1988. 36p[24] (ECA/PADIS/SEC/III/12/8/Rev.1)

40. ZWANGOBANI, Elliot.
Status of informatics in Zimbabwe: ECA/PADIS/IDRC Regional Seminar on National Information and Informatics Policies in Africa. Addis Ababa, 28 November - 1 December 1988. (ECA/PADIS/SEC/III/12/21).

41. IBI, Informatics and the Concert of Nations: Simultaneous growth. Rome: International Bureau of Informatics, [1985?]

42. INTERGOVERNMENTAL CONFERENCE ON STRATEGIES AND POLICIES FOR INFORMATICS, Torremolinos (Spain), 28 August - 6 September, 1987. Final report, Paris: UNESCO/IBI, 1979 (SC/MD/63).

43. SOUTHERN AFRICA REGIONAL WORKSHOP ON INFORMATICS, Victoria Falls, Zimbabwe, 12-16 May, 1986. In: Information Technology for Development, vol. 1, no. 3, 1986.

Note: Most of these papers can be obtained by writing directly to

PADIS/ECA
P.O. Box 3001
Addis Ababa
ETHIOPIA

J. LIST OF PARTICIPANTS

i. Country Participants

BOTSWANA

Mr. Ansu Datta
Director, National Institute of Research
University of Botswana
Private Bag 0022
Gaborone, Botswana
Telex: 2429 BD

Ms. M. Baffour-Awuah
National Library Service
Gaborone, Botswana
Telex: 2414 pula bd

ETHIOPIA

Mr. Teferi Kebede
Head, Information and Documentation Centre
Ethiopian Science and Technology Commission
P.O. Box 2490
Addis Ababa, Ethiopia

KENYA

Mr. Mainu Kariuki, Deputy Secretary and Team Leader
Ministry of National Guidance and Political Affairs
Nairobi, Kenya

Ms. Edith Muthigani
Principal Science Secretary
National Council for Science and Technology
P O Box 30623
Ministry of Research, Science and Technology
Nairobi, Kenya
Telegram: SCIENCETECH NBO

Mr. S.K. Nguli
Senior Economist/Statistician
Central Bureau of Statistics
Ministry of Planning and National Development
Nairobi, Kenya
Telex: 22696 foreignrb

Ms. Lily Nyariki
Principal Librarian
Kenya National Library Services
Ministry of Culture and Social Services
Nairobi, Kenya

MALAWI

Mr. Steve Mwiyeriwa
Librarian, Chancellor College
University of Malawi
Zomba, Malawi
Telex: 44742 Chancol MI

Mr. Ralph Masanjika
Senior Assistant Librarian
Malawi Polytechnic
Zomba, Malawi
Telex: (c/o UNDP) 44466 UNDP MI

TANZANIA

Mr. M. Mlolwa, Director of Planning
Ministry of Finance, Economic Affairs and Planning
P.O. Box 9242
Dar es Salaam, Tanzania
Telex: 41651 deptan tz

Mr. Christopher Ndamagi, EDP Manager
Tanzania Railways
P.O. Box 1018
Dar es Salaam, Tanzania

Ms. Ophelia Mascarenhas
Director, Library
University of Dar es Salaam
Dar es Salaam, Tanzania
Telex: 41327 UNISCIE

ZAMBIA

Dr. M.C. Lundu
Librarian
Copperbelt University
P.O. Box 21692
Kitwe, Zambia
Telex: ZA 53270

Mr. M. Ndhlovu Shitima
Data Processing Services Manager
Ministry of Finance
Lusaka, Zambia
Telex: 442221 MINFIN ZA
(Paper presented, but unable to attend)

ii. Commissioned Papers

EGYPT

Mr. Ahmed Bassit, Director General
ENSTINET
Academy of Scientific Research and Technology
Kasr el Aini Street
Cairo, Egypt
Telex: 225 77 STI UN

GHANA

Ms. Christine Kisiedu
c/o Department of Library and Archival Studies
University of Ghana
Legon, Accra, Ghana
Telex: c/i RIPS 2164 GH

ZIMBABWE

Dr. Elliot Zwangobani
NCR
P O Box 979
Harare, Zimbabwe

UNESCO

Mr. Cluzel
Intergovernmental Informatics Programme
UNESCO
7, Place de Fontenoy
75015 Paris, France

iii. Observers

Organization of African Unity:

Mr. Oyugi Aseto, Head
Research and Planning Division
OAU
P.O. Box 3243
Addis Ababa, Ethiopia
Telegram: OAU, ADDIS ABABA

Ms. Tarana Loumebeka, Economist-Statistician
OAU

Mr. Atef Wahba Ghabriel, Chief
Science and Technology Section
OAU

iv. Secretariat

ECA/PADIS:

Mr. Djamal-Eddine Benzine, Chief
Pan African Documentation and Information System
Economic Commission for Africa
P O Box 3001
Addis Ababa, Ethiopia
Telex: 21029 ECA ET
Fax: (212) 963-4957

Mr. Dejen Abate
Information Programme Development Officer
Pan African Documentation and Information System
Economic Commission for Africa (ECA)
P O Box 3001
Addis Ababa, Ethiopia

Ms. Nancy Hafkin
Chief, User Services
Pan African Documentation and Information System
Economic Commission for Africa (ECA)
P O Box 3001
Addis Ababa, Ethiopia

IDRC:

Mr. Shahid Akhtar
Associate Director
Information Sciences Division
International Development Research Centre
P.O. Box 8500
Ottawa, Ontario, K1G 3H9 Canada
Telex: 053-0375 recentre ottawa
Fax: (613) 238-7320

Mr. Philip William P. Browne
Senior Programme Officer
Information Sciences Division
address same as above

Mr. A. Terjanian
Senior Regional Programme Officer
Middle East and North Africa
IDRC
Cairo, Egypt
Telephone: 73760.

Mr. A. Camara
Regional Programme Officer
IDRC West African Regional Office
KM 5, Route de Ouakam
Dakar, Fann, Senegal
Telex: 489 recentre sg
Telephone: 214131/210773

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION II

THE PROCEEDINGS

ISSUES PERTAINING TO NATIONAL INFORMATION POLICIES IN AFRICA: AN OVERVIEW

D. Abate
Pan African Documentation
and Information System (PADIS)

CONTENTS

A. INTRODUCTION

- a) Background
- b) Definition of Public Policy

B. NATIONAL INFORMATION POLICIES IN AND FOR AFRICA

- a) Problems hindering improvements in information infrastructure and services
- b) Emerging information needs
- c) Scope of national information policies in and for Africa

C. INSTRUMENTS OF NATIONAL INFORMATION POLICY

- a) Range of instruments
- b) Legislation and national budgets
- c) Administrative rules, regulations and procedures
- d) Institutions
- e) Plans, programs and projects
- f) Government White Paper

D. INFORMATION POLICY ANALYSIS

- a) Information policy goals
- b) Information problem identification

E. CONCLUSION

F. REFERENCES

A. INTRODUCTION

a) Background

Following the attainment of political independence, most African countries turned to building their national economies. It was immediately obvious that resources were scarce so that they had to be allocated optimally after the careful definition of priorities, and the role of government in economic life was to be relatively strong because of the lack of development of the private sector. It was also realized that economic growth did not necessarily bring about overall development and that equity was as important, if not more so. This led to the pursuit of development policies and planning as instruments of African economic and social development over the last three decades.

Results have been mixed both between countries and over time. Both internal and external economic and political factors have influenced the performance of African economies, the attainment of development goals and the implementation of stated policies and plans. After thirty years of such developmental planning, many countries have yet to make much progress. Whether this dismal failure is caused by inappropriate policies and plans, ineffective implementation or a combination of both remains beyond the scope of this paper. In all the present discussions, however, the socio-economic and political reality in Africa should be considered, because the formulation, implementation and review of information and informatics policies is likely to face similar obstacles and possibly the same fate as other sectoral and multi-sectoral policy efforts.

b) Definition of Public Policy

According to SPENGLER [1955] "the term policy commonly refers either to policy objectives or to both an objective and the institutional instruments designed for its realization...Should the actual outcome of a policy differ from its intended outcome, then the content of the actual outcome must be distinguished both from the content of the intended outcome and from the content of the policy itself". Thus, he distinguishes between policy objectives, statements and outcomes although in common usage they all fall within the purview of public policy.

The African Association of Public Administration and Management (AAPAM), at the Seychelles Roundtable of 1980, on "Public Policy in Africa" endorsed the following definition:

> Public policy was accepted as a deliberate and binding action by responsible and authoritative organs of state (not always the Government) designed to influence the behaviour of society or substantial sections thereof. It is formulated to bring about a systematic way of solving fundamental national

problems. Systematization in severity of problems may be set against the resources available to deal with them and at the same time to harmonize the different aspects of sectoral policies with total policy [AAPAM, 1980].

The literature on public policy processes identifies a number of typologies for policy analysis. JONG-YOUL YOO summarizes four models:

i. Intelligence, promotion, prescription, innovation, application, termination, appraisal;

ii. Problem identification and development programme implementation, evaluation and termination;

iii. Formulation, search, comparison, interpretation and verification;

iv. Goal setting, problem identification, formulation of policy alternatives, choice of the optimum alternatives, realization strategy, and evaluation.

B. NATIONAL INFORMATION POLICIES IN AND FOR AFRICA

a) Problems hindering improvements in information infrastructure and services

National information policies in Africa should lead to a systematic resolution of the problems hindering development of information infrastructure and services. This is the raison d'être of information policies in Africa. The major problems to be resolved, and the developmental challenges that should serve as the basis for information priorities, will be briefly outlined before delving into the scope, process and instruments of national information policy.

It is a widely held belief that African decision-makers are not sufficiently aware of the relevance of information in national development. However, AIYEPEKU has suggested that decision- and policy-makers are in fact generally cognizant of the importance of information in their individual capacities [AIYEPEKU, 1988, pp. 18-19]. Their shortcoming is that this recognition has not helped to overcome the ambivalence governments pose towards information pursuits. Although individual attitudes are changing for the better, organizational response has not been tangible nor of significant proportions.

By far the major obstacle to information infrastructure building is the inadequacy of financial and material resources available for information activities. Given the predominant role African governments play in social and economic life, the low priority they attach to information activities is the major cause of prevailing shortcomings. The situation has been exacerbated by austerity measures enacted as a result of the prevailing crisis in the continent and by the increasing difficulty in disbursing funds for activities not budgeted for in development plans.

A further problem is the shortage of qualified information personnel. According to a study published in 1970 [DEVSIS Study Team] factors contributing to this include: (a) the lack of Africa-based training opportunities; (b) the orthodox approach to librarianship maintained by the few schools of library science; and (c) the inadequacy of re-training facilities for both middle-level and managerial information workers. Twenty years later, this analysis is still accurate. Furthermore, the most recent concern is that information managers should be well-versed not only in the principles of information and library science but also in management techniques. The reasoning behind this is that the future of African information services lays in the leadership capacity of information practitioners. It has been noted that:

> "it is essential that information practitioners do not remain librarians, documentalists or information scientists alone, but that there should emerge a class of information managers who act as politicians and defend the information cause at political forms; as salesmen who sell competitive information products in a difficult market place; as public relations officers who form and change information consumption habits; and, as managers who raise the financial, technological and human resources for information pursuits" [D. ABATE, 1987].

There are, however, two pre-requisites for the creation of such information managers:

i. information staff must be academically equal to the administrative and technical officers to whom they provide services; and

ii. their status in terms of financial remuneration and social recognition should be approximately on par with others of equivalent responsibilities [GEHRKE, 1985: 183].

The inadequacy of the existing information infrastructure is a serious problem. Many development institutions still operate with virtually no in-house information support, and very inadequate physical resources. Few countries have information services utilizing state-of-the-art technologies and associated practices that could serve as demonstration centres.

The inadequacy of investment in information infrastructure does not imply absolute government indifference. Substantial investments have been made in building up and maintaining information collection and delivery capacities in the form of national and sectoral libraries, documentation centres, archives, statistical offices, etc. The utilization of these has, however, been far below desirable levels [IDRC, 1988], mainly because of the imbalance in the supply and demand for information. The generalizations by E. BAARK, resulting from his study of national information systems in India and China, could equally well depict the African situation:

> "Most libraries and documentation centres still operate on the notion that when information is available it will be utilized, without sufficient consideration to the intrinsic (sources, delivery modes and channels, time factor, language factor, retrieval efficiency, coverage) and extrinsic limitations (socio-political framework, economic infrastructure, motivations to seek information)... Too much emphasis has been placed on the supply of services and too little on mobilizing demand. New information services have tended to be based on traditional library services. User studies are conducted only occasionally...little effort has been put into positive marketing of services.." [BAARK, 1986: 55-64].

In addition to the shortcoming of supply, there are also demand constraints. Numerous authors have attributed the root causes of underutilized information capacities in developing countries to the fact that reading habits and the impulse to use information are under-developed. Rote-learning and an emphasis on factual knowledge is emphasized in most high schools and universities, rather than training in problem solving and using a variety of information sources [GEHRKE, 1985: 183]. Developing the utilization of African information services has proved far more difficult than capacity building.

b) Emerging information needs

Having discussed some fundamental problems hindering information infrastructure and services, attention should now be given to emerging information needs, the provision of which should draw a similar degree of attention from national information policies.

It is widely agreed that over the last years, social and economic conditions in the continent have deteriorated mainly because of adverse climatic conditions, deteriorating international economic relations and inept economic management by governments. Attempts to face this situation have led to shifts in governmental priorities in response to different challenges [UNECA, 1987].

Both the understanding of African development problems, and implementing solutions, require substantial amounts of information input. But alterations in priorities cause corresponding changes in emphasis in information needs.

In sub-Saharan Africa, agriculture is regarded as a cornerstone of the economy. The present emphasis in development strategies in favour of agriculture and agro-industry, therefore, becomes one of the foundations for the priorities in information activities. Many African countries already possess agricultural statistics units, libraries and documentation centres, etc. There has been much recent talk of early warning food security information and environmental monitoring systems, etc. An effective way to meet the needs arising from multidimensional agricultural or rural development concerns includes farm management, adult education, farm credit, water management, appropriate technology, etc. It also includes the needs of multiple users involved in such processes like planners, extension agents, peasant leaders, district administrative officers, etc. This type of development requires innovative information collection, processing and delivery together with continuous experimentation and updating of methods. Recent technological advances in remote sensing, communication and data processing show unsurpassed potential [ABATE, 1987].

Sectoral development strategies, in areas such as trade, industrialization, transport, and communications, and natural resources exploitation require greater emphasis. Trade and industrial information services are still at an embryonic stage. Most African Governments have not been able to secure an in-depth knowledge of their natural resource base as yet. The information needs and ways of seeking such information on the African private sector are still little understood.

Public administration and economic planning, implementation and monitoring are the weakest links in the chain of government functions. Some of the shortcomings result from the inadequate availability and use of information. In addition, there is the need to follow-up and monitor the structural adjustment and readjustment processes which virtually all sub-Saharan African countries have initiated, particularly in their impact on social and economic life. There are three particular problems in this area: inadequate indicators to explain and monitor the phenomena, the lack of a mechanism for generating information and data, and thirdly, the absence of the information systems to regularly collect, process and deliver those indicators which have been defined and generated.

Information support for development pursuits takes numerous forms. Conventional thinking gave exclusive emphasis to printed, textual sources so that visual outputs with major information components such as cartography or geological surveys, were not considered as information outputs for dissemination and enhanced utilization.

c) Scope of national information policies in and for Africa

A definition of information as new knowledge disseminated in accordance with the information requirements of the receiver for the fulfilment of tasks is too narrow for the purposes of the present discussion. In this context, the term "development information" is more apt and may be defined as:

> "....intelligence or knowledge that contributes to the social, economic, cultural and political well-being of society, irrespective of the form it is encrypted in (text, figures, diagrams, etc.), the medium it is stored in (paper, magnetic, etc.), the mode of dissemination (oral, written or audio-visual, etc.), the social activity that generated it (research, administration, censuses, remote sensing, etc.) or the organizing and disseminating institutions (libraries, documentation centres, archives, statistical offices, mapping agencies, geological surveys, computer centres, media and broadcasting services, telecommunication services)."

The following functions qualify for inclusion in national information activity: research, statistics, media and broadcasting, entertainment, telecommunications, publishing etc. By extension the national information policy regulates activities within and across all these functions.

Customary references to national information policy, however, revolve around:

i. discreet processes in information activity i.e. generation, collection, distribution, etc.

ii. the aims of these processes with strong emphasis on published, textual information carried on paper media; and,

iii. the means of improving labour skills, financing, institutions, coordination, etc.

The literature on national information policy and experience in countries where it has been applied suggests that:

i. There appears to be consensus that national information policies should address the generation, collection and distribution of information, but the utilization of information as a subject of policy concern is frequently underemphasized and has only received attention relatively recently.

ii. There is less agreement on whether certain types of information (statistical, public administration, management, etc.) should fall within national information policies or not. The Guidelines on National Information Policy drawn up by UNESCO indicate that:

> "the task here is to state what types of information are needed to meet the requirements of various users (scientists, technologists, engineers, managers, administrators, educators, students, consumers, farmers, etc.). This involves assessing the relative users of archives, library transactions, documentation services, information and repackaging facilities, extension services, popularization programmes, referral services, expert services, consultation bureaux, seminars, conferences, etc. The task also includes ascertaining whether information is needed on current research, technical specifications, standards, patents, statistical data, maps, etc." [UNESCO, 1985: 8].

To this broad selection the following could also be added: meteorological data, geological inventories; land use/land resources information; management information and data, together with the activities related to them and the services they generate.

In spite of the above, however, experience indicates that national information policy efforts (draft policies and general thinking as reflected in published and unpublished literature) emphasize documentary information. In Malawi, a national seminar articulated specific goals and issues for a national policy on library and information services. In Botswana the authors of a report on coordinating information services, as the prelude to a prospective policy, argue that:

> "a heavy stress on libraries thus implies attaching a preponderant importance to the media of printed information... it means, conversely neglecting or at least de-emphasizing non-print information and operation such as the generation and use of knowledge...the July seminar opted in the short-term, for the narrower definition of information and wanted the proposed council to concentrate on the improvement of library and information services and...at later stage, the council could expand its

operation to include other fields of public knowledge and numerical data...given this approach the proposed council can have only a limited role" [DATTA, 1988].

A confidential draft policy statement of another African country virtually excludes even the mention of information sources and services other than library and documentation centres.

It is not the intention of this paper to examine the propriety of these few policy drafting efforts in concentrating on printed, documentary information. It is possible that practitioners in the documentary information field are much more active in the pursuit of national information policies. Others may not identify their functions to be within the information field, so that they take a very limited role in information policy and related exercises. Possibly the major reason is the preponderance of print-based media in the exchange of information within the modern sector in Africa today.

The issue to be resolved is the breadth and scope of national information policies (NIPs) in Africa: the narrow emphasis on library and documentation, or the broader basis to include statistical information services, rural extension information, news and media information, management information systems etc.). Each country will make its own choice depending on local circumstances. Botswana opted for the narrower definition because of the strategic considerations of concentrating "...in the first place, on the improvement of library services.." (Author's emphasis) [DATTA, 1988].

Theoretically there are apparent advantages and disadvantages in adopting the broader definition of national information policies.

i. A broad policy applies to a larger body of information leading to a fuller satisfaction of national information needs.

ii. A large number of often highly competitive and at times conflicting interests will be represented in a broad policy. Thus, particularly the early stages of policy formulation, may become a forum for bureaucratic infighting instead of a mechanism for harmonization and cooperation.

iii. On the other hand, a broader scope will provide a wider base of support which NIPs may need to overcome bureaucratic inertia.

Another aspect of the scope of NIPs involves the inputs required to bring about an improvement in information services. The guidelines prepared by UNESCO set out four basic inputs as bases for NIP objectives: institutional machinery (organizational framework); labour; physical facilities, and funding. Factors and issues relevant to each of these inputs are thoroughly discussed elsewhere and will not be

considered here. Suffice it to say that the rate of effectiveness of NIPs at providing adequate levels of these inputs is partially determined by the prevailing situation and degree of harmonization with sectors that have some bearing or the NIPs. For instance, the labour elements in information policy are affected by the country's overall higher education policy.

Many public policy areas have an interface with information policy:

(i) **Education policy**: the provision of post-literacy material; training students to seek out information; school and university library programmes; mid- and higher-level education and information work training; etc.

(ii) **Science and technology policy**: the application of informatics technology; library, information and documentation services for research purposes; scientific publishing;

(iii) **Public and state security policy**: confidentiality; personal privacy;

(iv) **Legal codes**: copyright; legal deposit; printing law;

(v) **Civil service and employment**: adequate remuneration for information workers; establishment/creation of new information units;

(vi) **National research policy**: research capability building through the provision of information for research and dissemination of research results;

(vii) **Fiscal and overall economic policy**: priorities for national development; use of accurate information and data for economic planning; flow of information in public administration; improvements in economic management with better information;

(viii) **Taxation policy**: import levies for information products (computers; books; etc.);

(ix) **Communications policy**: information transfer using modern telecommunications; pricing of communication services (telecommunication, postal, etc.);

(x) **Informatics/computer policy**: the application of informatics to information work; choice of technologies; etc.

To be successful, any NIP must take full account of the implications of other policies which may influence it.

In addition, there are procedures, rules, regulations and legal codes both public and organizational, pertaining to the initiation, formulation and review of public policy within governments, which are of critical importance.

C. INSTRUMENTS OF NATIONAL INFORMATION POLICY

a) Range of Instruments

Instruments of national information policy are those mechanisms that enable the analysis, formulation, implementation, enforcement and/or review of policy. Some instruments are applicable only to certain stages of the policy process whilst a number of others are essential features at all stages.

Instruments commonly available to policy processes are:

i. legislation with legal and/or budgetary provisions;

ii. administrative rules, regulations and procedures;

iii. institutions, including departments, autonomous agencies, committees, professional associations;

iv. studies, plans,programmes and projects;

v. comprehensive, documented government white papers describing policy;

vi. incentive/penalty schemes that encourage or discourage government, private sector or individual actions;

vii. propaganda and positive media action;

viii. technical standards, specifications, guidelines, etc.

ix. formal and informal consultations, including meetings, symposia, consultative groups, etc.

The use of these instruments are, therefore, what constitutes policy. The number that are in effect, the efficiency with which they are applied and their coherence is in essence the measure of policy. The ideal is where all are optimally utilized in a coherent manner.

It appears that most African countries use at least some of these policy instruments for their information activities. Indeed every African country has some legislation, rules, regulations or institutions concerned with information work. There is not, therefore, per se, an absolute lack of information policy, but on the other hand, it is often true to say that African countries do not have effective information policies, because the instruments are not applied consistently, or coherently.

In addition, the instruments used often fall far short of the scope, degree and nature of the changes and actions required to overcome the fundamental problems and developmental challenges that should be addressed. The following brief discussion on some of the issued policy instruments demonstrates this point.

b) Legislation and national budgets

Prominent amongst legislation applicable to information work are national deposit laws, printing acts and related public laws. The major problem, however, is lack of enforcement, the exclusion of some vital activities (e.g. unpublished material and the absence of clear confidentiality rules). Recent legislative efforts in Zimbabwe, Swaziland, Malawi and Zambia, however, may result in positive amendments and significant progress.

Most countries possess legislation regulating broadcasting and communications, including the use of telephone, telegraph, radio, television, etc. and such legislation is usually relatively much more effective. The agencies responsible for the services usually retain the licensing of private sector use. The legislation, however, does not always permit optimum dissemination of information.

Virtually every African country has enacted legislation on the establishment of numerous types of information institutions, including: statistical offices, libraries, documentation centres, the media, mapping agencies, etc.

In most African countries national legislatures vote on all public expenditures in the annual budget exercise. Budgetary legislation thus has a direct bearing on information work since requests for funding are debated and decided by parliament.

Future information policies must address the issue of appropriate legal instruments and sufficient levels of budgetary provision.

c) Administrative rules, regulations and procedures

Administrative rules, regulations and practices are perhaps the most crucial instruments of policy execution. For information purposes, such instruments include: import rules; customs duties; personnel recruitment and placement; disbursement of funds; etc. Under circumstances where formally recognized, coherent policies do not exist, administrative rules become de facto policies.

In Africa the prevailing rules were not developed in consideration of information work and they are often counter-productive. Even when the administrative guidelines were issued specifically to address decision-making and operation in information work, the basis and standards used were not arbitrarily.

Future information policies should, therefore, result in (a) the review and elimination of existing prohibitive regulations and practices; (b) the development of administrative instruments appropriate to overall information policy objectives; (c) and most importantly, the continuous monitoring of the interpretation and application of such rules and regulations.

d) Institutions

Generally in Africa, institutions have been the chosen instruments of policy formulation, implementation and evaluation. The existence or creation of autonomous or semi-autonomous institutions in the development field is an indication of the degree of government priority as for example, those institutions responsible for forestry, tourism, shelter, desertification and population. Often the institutions as described in the act of parliament give a good picture of the size and scope of the job. At times governments have envisaged the creation of an institution provided with a sufficient policy framework, so that as a result, institutional provisions appear to be interchangeable with policies. Occasionally, newly created institutions are charged with policy development.

Whether or not the large number of newly created African institutions have been worth the resources allocated to them is debatable. There is, however, general agreement that they have been indispensable elements of the development process. The weaknesses relate to overlap in mandates and lack of coordination as well as to shortages in qualified personnel, equipment, etc.

In Africa, as elsewhere, the creation of institutions responsible for coordinating the wide array of national information activities has not taken place. Rather, more common has been: (a) the setting up of national institutions responsible for collecting, processing and disseminating particular types of information (e.g. geological surveys, population and agricultural censuses, etc.); (b) the opening of sectoral and subsectoral library, documentation and other information units within government departments, and (c) re-definition of the mandates of existing institutions such as national libraries, archives, statistical offices etc.

Many African countries are still considering the question of creating a new national information institution. Such an institution has often been confused with a national information and documentation system or network. The argument rages around various pros and cons. The creation of a new institutions could give fresh impetus to the whole information effort; they could also establish badly needed linkages; clarify ambiguities as regards responsibility and accountability and provide promotional support, a revitalized image and a break with restrictive practices. On the other hand, a new structure could lead to duplication of effort, increased bureaucratic infighting and additional expenses involving the possible waste of resources.

In this debate, African information professionals have consistently opposed the creation of new institutions in favour of strengthening existing information infrastructure and a more even distribution of available resources to existing centres. Recommendations for national information and documentation centres in Malawi and Zambia are awaiting decisions by the respective governments.

African professionals attach great value to cooperation and coordination in information work. What is less clear, however, is whether this is to be achieved through purely voluntary means or enforced through government directives, with the result that information units are suspicious of the intentions of national coordinating bodies. Clearly information institutions do not want to lose their autonomy either to new structures or to rival institutions that may be strengthened at their expense. A better solution would seem to be the creation of committees and councils charged with coordination and harmonization functions. So far, however, their focus is library and documentation services.

Over the past few years, library associations have become vital instruments of policy and the flag-bearers of national information policies in the narrower sense of the phrase. They have enlisted the unreserved support of their membership. Whether they will command a similar level of government attention, however, will be demonstrated by the reaction to pending draft recommendations and policies.

e) Plans, programs and projects

The ultimate test of a policy process is the extent to which it has been translated into plans, programmes and projects.

National information plans as pre-requisites for improving information infrastructures and services was an idea accepted by the information community several decades ago. The inclusion of information plans in national development plans has been recommended repeatedly. A distinction should be made, however, between the annual plan dealing squarely with the yearly budget and the indicative perspective medium- and long-term plans covering three, five or ten years. Within the annual plan an information component may be a distinct chapter or may be contained within in the sectoral plans.

The incorporation of information elements into sectoral plans is already happening. Annual national plan and budget documents cite objectives, expenditures, activities, etc. of national information institutions (statistical offices, national libraries, archives, etc.). The problem in this regard is the poor basis on which the objectives and targets are set and the stagnant level of resources made available to information pursuits. At government, departmental and ministerial levels, however, information services often do not have stated objectives or separate budgetary allocations.

It is clear that it is not feasible for governments to totally distinguish information plans in national plan documents, since information is and should be, part and parcel of each sectoral plan. On the other hand, there is a need to devise mechanisms that will allow the comprehensive planning and monitoring of information activities throughout the sectors, in order to achieve an aggregate picture. An overall information plan is also a minimum requirement to plan and monitor development in basic information infrastructure such as labour, technologies, etc. The feasibility of integrating information plans in indicative national development plans is demonstrated in Algeria [Government of Algeria, 1985]. The relevant chapter in the Algerian development plan addresses information in a broader sense and includes management, statistical and documentary information.

The implementation of a national information plan, therefore, involves both sectoral and national-level information activities. Execution will take the form of regular activities, broad medium- and long-term programmes and short- to medium-term projects. Projects are the most basic level of planning and relate in detail to objectives, outputs, inputs and budgetary implications within a time-frame.

National information policies, therefore, should guarantee that : (a) the studies necessary to develop the plans are commissioned; (b) national information plans are devised; and that they appear as separate chapters in indicative plans; (c) plans in turn are developed into projects and programmes; (d) responsibility for these is assigned; (e) guidelines on monitoring and evaluation are laid down; and (f) a clear indication of the probable degree and nature of government support is provided.

f) Government White Paper

The forms taken by information policies are themselves instruments of policy since governments can package them in a number of ways, depending on comprehensiveness, length, the normal policy issuing methods of the government in question; etc. Policy could be declared by presidential decree, cabinet memorandum, party position paper, parliamentary statement or white paper.

A white paper is not only a statement but also an instrument of policy which serves as a reference during implementation later for policy review.

D. INFORMATION POLICY ANALYSIS

The introduction to this paper cited the steps involved in the policy process: goal setting, problem identification, development, implementation and review. Given the small number of information policy efforts in African countries, none of which so far have been ratified by governments, present discussions can only focus on the first three of these issues.

a) Information policy goals

From the examples of Malawi and the other still confidential national draft document, the following policy goals emerge:

i. to encourage the generation, collection and utilization of published and unpublished materials;

ii. to ensure support for infrastructure, facilities, technologies and manpower;

iii. to encourage access to and utilization of information;

iv. the implementation of a national information and documentation system.

b) Information problem identification

Problem identification in the two cases already cited was similar. The needs and availabilities of sectoral library and documentation services were possessed, and these served as the points of departure for policy development. Since the coverage and quality of the data collected uneven, however, it is doubtful whether problem identification was based on accurate factual information.

The ideal situation would have been the preparation of detailed surveys on national information needs, infrastructure and services, but the professionals concerned were ignorant of the basic factual requirements. There have been numerous recommendations for detailed quantitative surveys and analysis to be carried out. The lack of the considerable time and resources required for such efforts has doubtless proved a major constraint.

The next stage of the policy exercise - translating goals and objectives into feasible plans, programmes and projects - should induce all those concerned to assemble the data and carry out the required analysis. Too often, however, planning in Africa is undertaken without the necessary basic facts and this may also apply to information planning.

The policy development exercise involves translating the broad objectives into more specific, problem-oriented statements with an indication of the nature of actions to be taken and the instruments to be utilized. An examination of the few available information policy drafting exercises reveals a major weakness vis à vis the scope of the policies and the problems to which they are addressed. Although the objectives are sufficiently broad to encompass all major information functions (information in the broader sense of the word) the stipulated elements, instruments and strategies of policy implementation deal with library and documentation services only. Thus, the draft policies in essence are partly national library and documentation policies.

This does not mean that the draft policy documents are irrelevant. At the moment they constitute the most important milestones in putting library and documentation infrastructure services on a par with information needs and development challenges.

Setting a national policy process in motion is easier if responsibility falls purely within one particular sector (e.g. health). If the issues concern several government agencies, the interdepartmental responsibilities have to be clearly delineated. There are cases, however, where the issues are so nebulous that such definition is very difficult. Leading governments to creating committees, councils and sometimes, new agencies. The policy process, thus, takes its form and direction from the particular nature of the problem and the manner in which government decides to react to it.

Perhaps it is the lack of clear organizational responsibility that leads to difficulties in information policy formulation. If so, then the countries that have first created an institutional mechanism may have the right approach.

Once the impetus for a national information policy formulation exercise exists, then there are several essential steps: (a) maintaining the motivation; (b) establishing a consensus between the concerned parties; and, (c) the designation of the key personnel to produce the policy document. In those few African countries which have undertaken information policy efforts, the library community, through the library association, has not only been instrumental, but also largely responsible for all three stages. As far as possible, efforts have been made to involve other professional groups. The results have, however, been mixed. In Botswana, the group producing the report on coordinating information services was composed of librarians, academicians, researchers, data processing experts and policy-makers. Although its final recommendations were restricted to library and documentation services, it considered information policy from a fairly broad perspective. In Zambia, this was not the case, for drafting the policy document was entrusted to senior members of the library community. The creation of the government library and documentation service by act of parliament in Zimbabwe, although not strictly a policy effort, had major policy characteristics. It was developed under the leadership of the library association, but with the participation of other professional groups. In Malawi, a national multi-disciplinary seminar recommended policy goals, specific policy elements and the institutional and operational mechanisms for possible implementation [MWIYERIWA, 1987]. Although the recommendations refer to library and documentation services, it is by far the most exhaustive policy recommendation made to government.

E. CONCLUSION

In conclusion, it is clear that all the policy formulation efforts discussed above have been influenced significantly by the UNESCO guidelines by advisory services to member-States and by the five meetings co-sponsored with the respective governments and library associations. Since the information related problems and potentials in the countries concerned have much in common, the general approaches to and results of information policy efforts so far have been very similar.

F. REFERENCES

1. ABATE, D. "The Challenges African Information Services Face at the End of the 1980's". Pre-conference Reprint for the 53rd General Conference of the International Federation of Library Associations, 1987.

2. ADEDEJI, A. Opening Address to the Seychelles Roundtable of the African Association for Public Administration and Management (AAPAM). In Public Policy in Africa. AAPAM, pp. 1-9, 1980.

3. AFRICAN ASSOCIATION FOR PUBLIC ADMINISTRATION AND MANAGEMENT (AAPAM). Public Policy in Africa. 110 p., 1980

4. AIYEPEKU, W.O. "Development Information Utilization in Ethiopia, Zimbabwe and Nigeria: Findings and Recommended Action" [To be published by the Pan African Documentation and Information System (PADIS)]. 40 p.

5. AMIN, Samir. The Interlinkage Between the Agricultural Revolution and Industrialization: Alternative Strategies for African Development. Addis Ababa, UNECA, 17 p.

6. BAARK, E. Context of National Information Systems in Developing Countries: India and China in a Comparative Perspective. Lund, Research Policy Institute, 1986.

7. BAGUMA, R. "Public Policy". In Public Policy in Africa. AAPAM, pp. 17-25.

8. DATTA, A. et. al. A Report on Coordinating Information Services in Botswana and Gaborone. National Information Coordinating Committee (1988).

9. DEVSIS STUDY TEAM. DEVSIS-Africa: a Pan-African Documentation and Information System for Social and Economic Development. United Nations, 1979, 253 p.

10. GEHRKE, U. "Information for Development: Some Problems of National Coordination, Regional Cooperation and International Assistance". In: INSPEL, Official Organ of the IFLA Division of Special Libraries. Vol. 19, No. 3, 1985. pp. 166-196.

11. HAZLEWOOD, A.D. Economic Integration: Lessons for African Recovery and Development. Addis Ababa, UNECA, 1987. 34 p.

12. INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC). Information for Development: A Strategy for Sub-Saharan Africa. TS 64e,f, Ottawa, IDRC, 1988.

13. JONG-YOUL, Y. "Policy Processes in Developing Countries: the Case of the Republic of Korea". In: The Study of Public Policy: Comparative Approaches, the Institutional Context, Implementation and Effect. International Social Science Journal, Vol. 38, No. 2, 1986, pp. 237-250.

14. KIVINIEMI, M. "Public Policies and their Targets: A Typology of the Concept of Implementation. In: Ibid., pp. 251-265.

15. MWIYERIWA, S. (ed). Report: Seminar on National Policy on Library and Information Services. Lilongue, Malawi, 4-6 March 1987. 70 p.

16. SCHULTZ, H. et. al. Function and Organization of a National Documentation Centre in a Developing Country. Paris. UNESCO, 1975, 218 p.

17. SPENGLER, J.J. "From Theory to Public Policy". In: Economics and Public Policy. Brookings Lectures - 1954. Washington, D.C., The Brookings Institution, 1985. pp. 23-48.

18. WESLEY-TANASKOVIC, I. Guidelines on National Information Policy: Scope, Formulation and Implementation. Paris, UNESCO, 48 p.

19. UN ECONOMIC COMMISSION FOR AFRICA. "Improving Information Flows on the Follow-up Process to African Economic Recovery and Development". Fifth Session of the Joint Conference of African Planners, Statisticians and Demographers. Addis Ababa, 21-28 March 1988, UNECA.

20. UN ECONOMIC COMMISSION FOR AFRICA. "The Abuja Statement: the International Conference on Africa: the Challenges of Economic Recovery and Accelerated Development. Abuja, Nigeria, 15-19 June 1987. Addis Ababa, UNECA, 48 p.

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION III.1

LITERATURE REVIEW

NATIONAL INFORMATION POLICIES, PLANS AND SYSTEMS IN SUB-SAHARAN AFRICA

C. Kisiedu

CONTENTS

A. INTRODUCTION

B. OBJECTIVES AND SCOPE OF THE REVIEW

- a) Nature and scope of the literature
- b) Structure and presentation of the review

C. BACKGROUND DOCUMENTS

- a) UNESCO
    - i. Intergovernmental Conferences
    - ii. The Intergovernmental Conference on the Planning of NATIS
    - iii. Reports of the Director-General of UNESCO
    - iv. Policy Guidelines
- b) Non-UNESCO Sources: Individual Professional Input

D. INFORMATION POLICY DEVELOPMENT

- a) Information Policy Planning
- b) Legislation for library and information services
- c) Deposit laws and bibliographic control
- d) Copyright legislation
- e) The ineffectiveness of existing legislative instruments
- f) The mass media and telecommunication

E. INFRASTRUCTURE SURVEYS AND POLICY DEVELOPMENT

- a) Sector-oriented surveys
    - i. Tanzania
    - ii. Ethiopia
    - iii. Kenya
- b) Survey of Specific Institutions
    - i. Ethiopia and Kenya
    - ii Seychelles and Mauritius

F. REGIONAL INITIATIVES

- a) Conferences
- b) Regional networks
  - i. The Nairobi Conference
  - ii. PADIS: The Pan-African Documentation and Information System
  - iii. SADIS: The Southern-African Documentation and Information System

G. NATIONAL INITIATIVES

- a) Conferences, seminars and surveys
- b) Professional opinion
- c) Co-ordination, Co-operation and Resource Sharing: Central Issues in Information Policy and Systems Effectiveness
- d) Recent National Action or statements in the direction of policy
  - i. Zambia
  - ii. Botswana
  - iii. Kenya
  - iv. Tanzania
  - v. Uganda
  - vi. Malawi
  - vii. Ethiopia
  - viii. Zimbabwe
  - ix. Swaziland and Lesotho

H) CONCLUSION

- a) General Conclusion
- b) Specific comments and recommendations
  - i. Research into professional policy and national information requirements
  - ii. Over-Dependence on foreign consultants
  - iii. Non-Implementation of report recommendations
  - iv. Legislation
  - v. Over-dependence on foreign information sources
  - vi. The new technology
  - vii. Integrated information and communications system
  - viii. Overstatement of information policies
  - ix. The private sector
- c) Summary of Recommendations

I) REFERENCES

J) ACRONYMS USED IN THE REVIEW

A. INTRODUCTION

African countries are becoming increasingly aware of the fact that information, especially specialized information, is an indispensable factor in the development and rational use of their total natural and human resources. Information is one of the costliest and fastest growing industries in modern times. It's introduction, therefore, requires careful national planning to ensure that every sector of the economy benefits. The development of information systems and services needs to be planned as an integral part of a country's development plan and not as an adjunct to it.

This growing awareness of information is the result of years of co-operation with, and assistance and encouragement from the United Nations Educational Scientific and Cultural Organization (UNESCO); international information systems such as the International Information System for the Agricultural Sciences and Technology (AGRIS) of the Food and Agricultural organization (FAO), International Nuclear Information System (INIS) of the International Atomic Energy Agency (IAEA); the Commonwealth and national organizations and institutions, particularly the International Development Research Centre (IDRC) of Canada and the German Foundation for International Development (DSE).

UNESCO's assistance in the development of library and information infrastructures, especially in developing countries, since the 1960's, is well documented and needs no detailed elaboration here. Within the context of development from which the new, emergent countries were viewed in the early 1960's, UNESCO and other assistance organizations recognized that libraries were no longer mainly cultural, but were seen "in conjunction with other information sources, as a vehicle for development" [U. GEHRKE, 1985, p. 168].

The change in emphasis since the 1970s from assistance in the development of individual institutions to the development of institutional infrastructures for the establishment of national information systems led in 1974, to the concept of National Information Systems (NATIS), the UNESCO framework for establishing integrated national library, documentation and archive services. The Intergovernmental Programme for Co-operation in the field of Science and Technological Information (UNISIST) launched in 1972, was concerned solely with the development of scientific and technological information. A framework was required, therefore, especially for developing countries, to take account of non-scientific information.

Thus, one of the prime objectives of NATIS was that a national information policy reflecting the needs of all sectors of the community and of the nation as a whole, should be formulated, to guide the development of an overall plan for incorporation into the national development plan. The rationale for this was that governments would be committed to execute national information programmes and ensure their viability, if they had invested time, effort and, above all, funds in their establishment.

Despite all the various efforts, however, by the early 1980's, few African countries had given serious consideration to formulating a national information policy, let alone to establishing a viable national information system.

In the past few years, there has been growing interest and activity throughout Africa in the development of national information infrastructures, regional and international co-operation, and ultimately in national policy. The emphasis is on creating endogenous systems, on the basis of local initiatives, with international assistance.

This development can be attributed partly to the growing impact of the new technology on the information industry and the resultant information culture dominated by computers and the other new technologies, which have resulted in new demands, emphasis and orientations. In addition, the increasing inaccessibility of information for viable decision-making in most African countries, because of ineffective and inefficient information handling techniques and archaic systems, is widening the gap between the "information rich" North and the "information poor" South. W.O. AIYEPEKU [1983] assesses the critical information situation as follows:

> "African states have recognized for some time ... that the situation with regard to documentation and information about socio-economic development in Africa is far from satisfactory. Many countries do not have mechanisms for keeping track of the published and unpublished information generated in the context of the activities of their planners, economists, scientists, and other individuals who have responsibility for implementing national development plans. They often lack organized access to the relevant information produced by bilateral and multilateral aid agencies. Consequently, these countries often continue their planning and programming in ignorance of vital facts that have been documents" [p. 35].

Many African information professionals and a growing number of decision-makers and researchers have realized that the solution, indeed the salvation of their countries, depends on mutual collaboration, more serious consideration of the need for development information, and policies and systems which can make that information more easily available.

B. OBJECTIVES AND SCOPE OF THE REVIEW

a) Nature and scope of the literature

This survey attempts to comprehensively examine individual national and regional priorities, trends and directions taken by existing development information policies and systems in the context of shared experiences. The geographical scope of the review is the Eastern and Southern African sub-region.

The bulk of the literature of direct relevance to national information policy for Africa consists almost entirely of unpublished draft proposals on policies, plans, recommendations and declarations emanating from conferences that concern individual countries or the region in general.

Of considerable importance are the articles in periodicals and conference papers which describe and evaluate existing information systems and infrastructures, or address important topical issues.

Acts and legislative instruments establishing information services and institutions provide direction by defining the areas of and limits to responsibility.

There is other documentary material in the form of consultancy mission reports resulting from surveys of information systems and services generally, the information status of specific sectors of the particular economy, or specific institutions such as archives. Such studies usually contain recommendations and conclusions with policy implications, while some even put forward detailed plans and guidelines for future policy formulation.

Lastly, some documents address issues of information policy at the national and international levels in general terms. Although they do not relate specifically to Africa, they are important as background to the whole concept of national information systems management and the policies that are essential for the systems' viability. UNESCO is the main source of such documents.

b) Structure and presentation of the review

As the above summary suggests, there are very few monographs on the subject of information policy for the African region. Even in the "information - rich" North, information policy is a new concept that is only now attracting professional and intellectual attention. In Africa and other developing countries, the field is even less tested and thus its intellectual organization is rather problematic. Although issues and elements of policy are well known, the literature presents no unified approach to their discussion. Reports and articles by information professionals touch on every aspect of information including policy matters.

To impose some structure on the literature, therefore, a combination of problem-oriented and source of document presentation is adopted, rather than a country-by-country approach. This should avoid the repetition of issues. Obvious national trends, especially current attempts at policy formulation, will be discussed under relevant country headings. Thus, the review first considers the background literature, examining general discussions of and guidelines on information policy issues, mainly those generated by UNESCO.

Section two on policy development, will focus on information infrastructure development. Institutional surveys and policy documents will also be dealt with in this section.

This will be followed by observations and comments on important issues related to the review material, with recommendations as appropriate.

The study concludes with consolidated recommendations.

Terms such as information, information policy, information technology, and documentation have been the subject of many definitions. Throughout, their use will conform with definitions provided by UNESCO/PGI at the UNISIST II Intergovernmental Conference of 1979.

C. BACKGROUND DOCUMENTS

One very effective means by which the topicality of the concept of national information policy has been maintained is its internationalization. Since the issue first appeared on the international agenda, general discussions at national and inter-governmental levels and guidelines for establishing information systems and policies, have proved useful to member States in their efforts to give the matter national attention.

a) UNESCO

The most prolific source of background documents is UNESCO:

i. Intergovernmental Conferences (UNISIST/NATIS/PGI)

Since the UNISIST programme was launched in 1972 a body of literature has accumulated from intergovernmental meetings and conferences in the form of position papers, recommendations, guidelines, and procedures for processing information, setting up information systems, and developing national information policy. In spite of its science-oriented, sectoral approach to information issues, the UNISIST I Conference considered that the establishment of a national information policy was one of the most important prerequisites for taking advantage of the proposed World Science Information System. For developing countries, the National Focal Points and UNISIST Committees respectively became centres for dealing with policy matters, infrastructure development, and scientific and technological information.

ii. The Intergovernmental Conference on the Planning of NATIS (UNESCO, 1974)

The Intergovernmental Conference on the planning of NATIS (UNESCO, 1974) aimed to encourage the integrated planning of national documentation, library and archive infrastructure and its report is the most comprehensive statement of the need for an integrated policy approach to such development. Robert V. WILLIAMS (1988) declares that the NATIS programme "was - and, to some extent still is - UNESCO's most systematic plan for the development of a worldwide information system". Whilst acknowledging the preoccupation of UNISIST with scientific information he gives UNISIST II the credit for establishing the necessity of developing national and international information policy to assist in the building of systems leading to the flow of appropriate information and technology to the developing nations.

The Intergovernmental Council of the General Information Programme (PGI) at its sixth session (November 1986), reviewed the activities for the two previous years, following the alienation of some western member States from UNESCO and the resultant drastic cuts in the organization's budget. Particular mention was made, of information personnel and user training, policy and infrastructure development and regional networking, where proper development was threatened unless extrabudgetary funds could be mobilized.

It was recommended that programmes be initiated to facilitate technology transfer to developing countries and that data bases and model information systems should be established to demonstrate to decision-makers and information professionals the impact of modern technology in information handling and on the decision-making process.

iii. Reports of the Director-General of UNESCO

UNESCO's mass media policy is the most visible part of its information agenda and the cause of the alienation mentioned above.

The organization has, however, achieved commendable success in its communication programme for developing countries, as shown in the reports of the Director General of UNESCO (1979/80; 1981/1983), especially in the development of communication policies and infrastructures, of the three regional communications policy conferences, mentioned in the 1979/80 report one was held in Yaounde, Cameroun, in July 1980. The conference laid down the principles for formulating and implementing communication policies in member States and stressed self-reliance at the national and regional levels and technical co-operation to strengthen national and regional integration to increase the flow of information.

The report mentions several training programmes both at the national and regional levels in Africa and projects benefiting several African countries.

The 1981/1983 report provides information on follow up action to the recommendations made by the 1979/80 Intergovernmental conference and continued assistance in infrastructure and policy development. Of particular importance to Africa was the establishment of the Pan African News Agency (PANA) which began operations in 1983; technical and financial sponsorship to organize a regional African workshop on communication policies and planning, in 1983; the creation of fifteen rural newspapers in five Sub-Saharan African states, and assistance to scientists in African and other Third World countries to develop appropriate low-cost equipment, all in the context of establishing a new world information and communications order.

iv. Policy Guidelines

Victor ROSENBERG [1985] observes that "perhaps the most relevant materials produced by UNESCO in the area of information policy are the guidelines for the development of information and the documents from the UNISIST II Intergovernmental Conference on Scientific and Technological Information for Development (UNESCO/PGI 1979a; 1979b; and 1979c), which contain a summary of the meetings". This assessment excludes the latest and most comprehensive of the UNISIST guidelines - that by Ines WESLEY-TANASKOVIC [1985] - which contain a step-by-step approach to national information policy formulation and implementation. R. AUBRAC [1988] points out that it neglects certain major problems such as the training of staff and the choice of equipment, but nevertheless, it suggests alternatives for countries to choose from according to their circumstances.

The breadth of view reflects the vast experience from which it was drawn and it has formed the basis of ongoing attempts to formulate information policy in the African region.

UNESCO's guidelines on national and international scientific and technological information (STI) policies were reviewed by Raymond AUBRAC (1988), for the benefit of all agencies (bilateral and multilateral) involved in this field.

He examines the evolution of the problem of national information policies, with special emphasis on those of developing countries and focuses on those recommendations that relate directly to this issue.

The review is a lucid presentation of the activities of UNISIST and its changed perspective with regard to the development of information systems for developing countries.

A number of the UNISIST documents reviewed by ROSENBERG address information policy issues over the period 1974-1980. He notes that they reflect a progression of policy approaches from more or less traditional library concepts (UNESCO 1974b), through concern with the structure and operation of national information centres, policies for managing information resources and increasing document availability, the impact of changing technologies and the policies needed to deal with the rapid change, to the emergence of networks and microcomputer technology and the development of standards to make that technology more accessible.

ADAMS [1976; 1977; 1980] and SLAMECKA [1979] report on four successive meetings on the planning ind implementing of national information activities on science and technology in which these changing policy issues were addressed. The fourth conference in 1980 focused on the role of information in national development. At this meeting UNISIST began to consider social issues such as the ownership of intellectual property, the hardship to developing countries caused by the increasing use of advanced technology and national capabilities for using information. Thus, ROSENBERG comments "the international community seems to have moved from the optimistic view that any nation can set up a national information exchange to the more pessimistic view that technology is putting the weaker countries at a greater and greater disadvantage" [p. 15].

There has been considerable disappointment, certainly from UNESCO, that the high hopes of NATIS implementation and of the advantageous effects on the information systems of member States have not been fulfilled, nor its practical value sufficiently publicized. An answer exists in a survey report compiled for UNESCO by J.P. POLINIERE [1974]. In a user-oriented survey of information systems and the literature on them, POLINIERE postulates that any information institution depends for its success on the existence of crucial links between information sources and users. He describes national information systems as "a set of inter-related information institutions which jointly switch information to the user" [p. 3]. He regards a central co-ordination mechanism for linking weak institutions into a network as the main remedy for the inefficient performance of information systems, rather than the establishment of new systems African countries would be well advised to take a serious note of this observation.

UNESCO's concern prompted the organization to sponsors the meeting of a Group of Experts to draw up a plan of action for the implementation of NATIS 1974. The meeting recommended a comprehensive programme to promote NATIS, including a series of studies to form guidelines aimed at a clearer explanation of the NATIS concept.

A more conventional planning document was compiled jointly for UNESCO by Jacques H. d'OLIER and B. DELMAS [1975]. Their monograph on documentation, libraries and archives planning does not merely establish the necessity for formulating a general information policy and principles for building a national documentation system, it also considers the methodology for providing information services to meet user needs and discusses crucial policy issues such as information personnel training, networking and the provision of guidelines adapted to the level of development and size of the country concerned.

Pauline ATHERTON [1977] in a handbook on concepts and prevailing practices concerning the planning and functioning of information systems and services, considers issues such as the need to promote collaboration and inter-connection of library and information services at national, regional and international levels in order to ensure the unimpeded flow of information from generator to user. The handbook is addressed to "students and science information personnel of the developing countries who may be in a position to plan or develop new information services; for emerging managers of information systems and services ... in obtaining an overview of the field, including questions of information policy and planning, management and organization of information systems and services, procedures and methods, standardization, facilities and equipment and training aspects" (Preface).

This volume gives a helpful definition of information infrastructure focusing on the seven component elements, the last of which is national policies and examines and proposes schemes for their exploitation for development. The focus on developing countries, with examples of operational systems drawn from Africa, makes the handbook directly relevant.

b) Non-UNESCO Sources: Individual Professional Input

The points of view on information policy issues of individual professionals, taking both national and international perspectives, provide a direct approach to interpretation of issues which can make them easier to comprehend and assimilate.

Andrew A. AINES and Melvin S. DAY [1975] identify factors inhibiting the formulation of a national information policy, emphasizing the complexity and interdisciplinary nature of the process. These include negative attitudes, lack of leadership, insufficient public understanding and standards, technological competition and influences of international organizations. (For example, many African countries suffered as a result of the confusion resulting from the rivalries between UNESCO's UNISIST and NATIS programmes).

International information policy and information transfer involve complex processes affecting information generators and recipients alike. WILLIAMS examines the role of Intergovernmental Organizations (IGOs) in this area and focuses on the delicate nature of the processes and issues involved, for example national sovereignty, security, copyright, patent protection, standards, dependence "the free flow of information for scientific progress and the growth of democracy" [p. 2].

He observes that there has been greater progress in international information transfer because developing countries, usually the transfer receiver, have confidence in existing international information systems (e.g. AGRIS, INIS and INFOTERRA of the United Nations Environment Programme). In his view, this augurs well for future understanding of and progress on policy matters which require that nations relax entrenched positions in defence of political, economic, ideological and sovereignty interests.

D. INFORMATION POLICY DEVELOPMENT

a) Information policy planning

National Information systems management has clear implications, a policy plan whose objective, according to J.A. BOON [1984], is to protect, develop, control, retrieve and make information available as a national resource and to promote its use throughout society. The objective also includes a definition of priorities and a problem-oriented co-ordination of resources. The policy plan is usually made up of statements on a number of policy positions and developmental guidelines given the status of law by means of legislative action. Ideally, this should comprehensively cover all sectors of the information industry, for example, libraries, documentation/information centres, computer science, mass communications media and telecommunications.

In Sub-Saharan Africa, such officially stated and legitimized plans are rare although individual institutions or sectors of the information industry, especially in mass communications, may have their own rules and guidelines. There are now beginning to emerge draft guidelines or statements of intent for consideration by governments.

b) Legislation for library and information services

The absence of unified information policies in Sub-Saharan African countries means that certain documents that may not strictly be policy documents have had to be classified as such, because, in so far as they offer legitimacy and guidance to information institutions, they constitute policy guidelines, however limited and inadequate.

Legal instruments such as the various laws establishing libraries and library boards, national library services, archives and documentation centres; deposit laws for the control and dissemination of national output of literature; and copyright laws for protecting the ownership of intellectual property represent the most basic policy documents in the sector. Their aim is to ensure the unimpeded flow of information.

M.M. NHLAPO [1985] confirms that such basic, legislative instruments existed in many African countries long before independence, since the Library Board, Library Services, and Archives Acts were designed to regulate public library and archives facilities in the colonies. Such legal provisions have been expanded, amended or repealed according to the demands of changing national perspectives and aspirations or new ones have been enacted for newly created institutions [p. 14]. Their main functions is to define the scope and objectives of information institutions and direct the focus of their responsibilities.

B.Y. BOADI and Peter HAVARD-WILLIAMS [1983] refer to the UNESCO-sponsored Ibadan Seminar on the Development of Public Libraries in Africa (1953) as a pace setter in its advocating "the adoption of appropriate legislation to ensure a service that had a well-defined administrative set-up and adequate financial support" [p. 9].

For the countries of the former East African Community, i.e., Kenya, Tanzania and Uganda, J.S. MUSISI [1981], K.J. MCHOMBU [1984] and S.A.H. ABIDI and J. KIYIMBA [1983] all refer to the HOCKEY Report of 1960 as the basis for such legislative action and mention the influence of the Ibadan seminar. The Tanzania and Uganda Library Services were established by Acts of Parliament in 1963 and those in Kenya in 1967, with the brief to "promote, establish, manage, maintain, and develop libraries" (MCHOMBU).

Library development has been uneven in Southern Africa. Zambia and Lesotho established library systems and services without legal mandates. Francis INGANJI [1983] points to a number of problems in Lesotho resulting from this vacuum, such as a lack of financial support and haphazard growth and allocation of responsibilities [p. 39]. M.M. MOSHOESHOE [1986] examining the situation from the international perspective, deplores Lesotho's inability to contribute to and benefit from the Universal Availability of Publications (UAP) and Universal Bibliographic Control (UBC) provisions.

B.M. LUNGU [1985]) in his extensive comments on the Zambian situation criticizes the failure of attempts in 1976 and 1978 to persuade the Government to provide legislative support and direction for the country's library services and comments on the resultant lack of identity and the uncontrolled pattern of development of those services [p. 5].

Botswana, Swaziland, Malawi and Zimbabwe have legally established library services. The Drafting Committee (1987) on A Co-ordinating Body for Botswana's Information Systems refers to an impressive development of library services in Botswana since independence and the establishment of the Botswana National Library Service (BNLS) in 1968.

R.S. MABOMBA's sectoral account [1987] of information services in Malawi describes a viable national library service having a clear vision of its responsibilities and regular funding as a result of the National Library Service Act of 1967.

Although the library history of Zimbabwe can be traced to the late nineteenth century, Peter C.MAZIKANA [1987] states that a National Library and Documentation Service (NLDS) was legislatively established only in 1985 and became operational in 1987 [p. 171].

The Indian Ocean Islands of Seychelles and Mauritius have smaller less well developed library services. Marie Consuelo BENOIT [1984] refers to the "birth" in 1978 of the National Library of Seychelles but with no indication whether this happened through legislative action or not [p. 8]. Gaetan BENOIT [1984] recommended for Mauritius, a new law to replace the existing library law and refers to the ineffective legislative action already taken in support of the country's library services.

c) Deposit Laws and Bibliographic Control

Legal deposit provisions establish institutions and responsibilities that ensure bibliographic control of national publications and their dissemination at the national and international levels. BOADI and HAVARD WILLIAMS examine legal deposit in the context of international co-operation, with particular reference to the concepts of Universal Bibliographic Control (UBC) and Universal Availability of Publications (UAP).

They explain the requirements of UBC which make it the responsibility of each country to provide a regular record of publications issued within its borders, on the basis of internationally accepted standards, in order that reading material may be available to all. This mechanism for bibliographic control which should be ensured by legal deposit provisions, consists of a national bibliographical agency, normally a National Library where a copy of each publication must be deposited by its author, printer or publisher, and perhaps also in other designated deposit centres, in order to enable the compilation of a national bibliography at specified intervals.

The literature suggests that these conditions are only partially met even by libraries with legal deposit laws.

ABIDI and KIYIMBA; MUSISI; J.M. NG'ANG'A [1983] and E.E. KAUNGAMNO [1983] writing respectively on Uganda, Kenya and Tanzania, point out that such services have been established at various times and that national bibliographies are issued. NG'ANG'A's report and wide coverage for Kenya's bibliographic affairs in International Cataloguing, July/September 1984, show that a national bibliography was first issued in 1983. ABIDI and KIYIMBA refer to difficulties in the application of Uganda's deposit laws and in ensuring strict and comprehensive control because of legislative and political problems.

The Report on Co-ordination for Botswana mentioned earlier refers to "the confusion resulting from the existence of different laws on legal deposit" [p. 10] which makes it difficult to obtain accurate figures of books published in the country. A major work by LEBOKA [1983] advocates rationalization of the existing laws.

MABOMBA, Angeline KAMBA [1984], P.C. MAZIKANA [1987] and M. WALUBITA [1988] state that in Malawi, Zimbabwe, and Zambia the national archives are the deposit libraries and bibliographic agencies. They are a colonial legacy from when there was a centralized archive for all three territories in Salisbury (now Harare), with legal deposit status. KAMBA and MAZIKANA give substantial information on deposit provisions in Zimbabwe, which seem to have been functioning quite satisfactorily. The national archives have issued the Zimbabwe National Bibliography since 1961 and KAMBA observes that "the successive versions of deposit legislation (1916, 1938 and 1975) have ensured some measure of success" in bibliographic control of the country's publications.

The deposit laws of Ethiopia, Malawi and Swaziland have been examined. Ethiopia's Deposit of Printed Materials proclamation No. 50/125 requires that three copies of each book be deposited with the Ministry of Culture and Youth. Malawi's Printed Publication Act (1st March 1984) invests deposit status in the national archives and requires one copy of each book published in the country to be lodged there. The Deposit and Preservation of Books (1978) is an amendment to Swaziland's Copyright Act No. 36 of 1912. It confers legal deposit status on three libraries and requires that each should receive a copy of any publication issued in the country from the publisher.

None of these laws mandate a responsibility for issuing the national bibliography.

A proposed amendment of Swaziland's Copyright Act - Draft National Service Bill (1984), "to establish the National Library Service and to provide for matters incidental thereto" (title page) would repeal the 1978 Act. The Copyright and deposit provisions as well as the main library legislation for establishing the Swaziland National Library Service would then be incorporated into one legislative instrument. B.J. KINGSLEY (1988) suggests that the Bill has not yet become law.

d) Copyright Legislation

There is little mention of this in the literature, Copyright is mentioned only in the title of the Swaziland legislation which deals with deposit arrangements which that law incorporates. Botswana's Report on Co-ordination merely refers to "confusion" caused by the existence, in the Botswana Statute Books, of two different copyright conventions - the Berne Convention (1948) and the Universal Copyright Convention (1952) and that clarification as to which of them should be applied is not clear in the existing law.

e) The Ineffectiveness of Existing Legislative Instruments

It may be seen, therefore, that not all libraries and documentation services in the sub-region enjoy legislative support. and where it is given, it has not been successful in making the services efficient in discharging their responsibilities. The available literature suggests a number of reasons:

i. Present legislation is limited, covering only institutions and services in the public library system. Other information systems and services, including libraries in government departments and ministries, the private sector, parastatals, commercial and banking institutions are not covered. They derive indirect legitimacy from the acts which established their parent institutions, even though there may not have been any mention of such services in the Acts. LUNGU [p. 5] certainly corroborates this scenario for the special library and documentation centres in Zambia. MAZIKANA [1983] has pointed out, however, "a national information service consists of much more than just the libraries" so that legislative provision is required for all types of information systems and institutions that may exist in a country;

ii. The absence of a co-ordinating agency works against effectiveness. Library Boards or Services may perform this function for the Public Library System. This shortcoming is mentioned by MUSISI, KAUNGAMNO, MCHOMBU and by practically all authors who discuss information problems in general terms and not only in relation to library legislation;

iii. Deficiencies in the legislative instruments are another factor. NHLAPO [1970] states this to be the case with particular reference to deposit laws, in Swaziland. Angeline KAMBA recommends a revision of the deposit law in Zimbabwe to bring it in line with UNESCO guidelines. Uganda's deposit laws are reviewed by ABIDI and KIYIMBA

> and Kenya's by MUSISI. The deficiencies cited include publishers' ignorance (and plain disregard) of the existence and requirements of the legislation; cumbersome methods of deposit, and unrealistically low fines for non-compliance which do not act as a deterrent. Other sources of weakness are government exemption from deposit obligations (e.g. in Kenya), though they are the largest publishers in African countries; and, the general lack of coverage for the new publication and audio-visual media, such as video cassettes, magnetic tapes and discs.

These factors have impeded the bibliographic control of national publications and reduced the capacities of African countries to control (UBC) and provide access (UAP) even to local users. D. ABATE [1986] summarizes as follows:-

> "Very few countries have national policies and legislation that govern and regulate the organization and utilization of information. Where they exist they are either poorly formulated or remain unenforced. The cause lies in the fact that there are no central agencies responsible for information that have the powers and mandate the particular situation requires. Even when such structures exist their tasks are not adequately defined or they lack the authority or the capacity to establish a realistic policy and plan and defend it at the national legislative and executive levels. While it should not be assumed that legislative framework would resolve all the bottlenecks, it is nonetheless true that good legislation facilitates the creation and development of infrastructures" [p. 79].

To address this situation E.E. KAUNGAMNO [1978] recommends an integrated approach to the provision of library services in African countries. He outlines the rationale for and functions of national library policies within Africa and suggests a central co-ordinating body or agency controlling a centralized system or, a loose network of independent systems. This is a valid basis, but the current approach to integration embraces all information centres and systems, not just libraries.

f) The Mass Media and Telecommunication

ROSENBERG observes that information policy can cover everything from telecommunication to journalism. Blaise CRONIN [1987] goes further into the complexity of the issues involved, including media control and ownership, privacy and security, broadcasting policy, licensing, telecommunications, intellectual property rights, and transborder data flows These aspects, however, receive little attention in the literature on legislation in particular and policy in general.

Individual institutions such as newspapers, broadcasting and telecommunication institutions tend to have their own institutional policy guidelines enshrined in the Acts that established them (BOON).

E. Infrastructure Surveys and Policy Development

Attempts by African governments to develop information infrastructures and to strengthen their information capabilities have often taken the form of requests for consultants or experts from UNESCO or some other international body, as well as from government and non-governmental organizations, to undertake surveys either of the status of scientific and technological information (STI) generally, or of specific sectors (usually science and technology oriented) of the economy. There are also several general reviews of existing library and information facilities and of specific institutions in the field of information.

As Ulrich GEHRKE [1985, p. 169] observes "a large number of consultancy reports, mostly established in close co-operation with local experts and including recommendations for further action, have resulted from these missions". Many have helped in establishing viable infrastructures. Several have not been implemented, but their recommendations should form relevant bases for future policy action. The following examples demonstrates the point.

a) Sector-oriented surveys

i. Tanzania

E.E. KAUNGAMNO [1985, p. 17] refers to a "proliferation of reports by foreign experts in connection with the establishment of National Networks and Documentation Centres in Tanzania. Charles BOURNE [1974], a UNESCO Consultant, was invited to advise the Tanzania government on the Establishment of a national centre for scientific and technological documentation. E. SAMAHA [1978], another UNESCO expert, produced a study on the application of science and technology in development. The SAMAHA report provides a clear assessment of information needs and methods of information transfer and dissemination in the agricultural, industrial, health and medical sectors of Tanzania's Kilimanjaro region and attributes the problems to the absence of a national information policy to provide direction and ensure material and other relevant support. Recommendations suggested co-ordination, resource sharing and the need for a national information policy.

A mission was recently undertaken by SAREC (1984), the Swedish organization that co-ordinates research co-operation in developing countries, to re-investigate the feasibility for establishing a national research information service.

A number of consultancies have been undertaken in some research and information centres in the crucial agricultural sector. B. HOLMBURG [1982] makes reference to "previous consultancy missions" in 1975 and 1976.

The 1975 mission undertaken by M.J. MENOU resulted in a report titled "Project for the establishment of a national agricultural system (Tanzania): Report of a consultancy mission" (FAO.URT/71/527). R.F. MUNN's mission produced the following report: Improving agricultural library services in Tanzania. HOLMBURG further refers to several other consultancies and consultations with the authorities by staff from FAO in Rome and IDRC and to an in-depth UNDP study on the overall structure of agricultural research in Tanzania.

Such reports usually embody conclusions and recommendations with guidelines or actual plans for subsequent official policy decisions. HOLMBURG's brief was to stress the network approach for agricultural information resources and to define those of relevance to that sector. He recommends the creation of a network of co-operating information units from existing centres and systems so that they can make optimal use of existing and international resources. Recognizing the growing importance of new technology in information handling, the report recommends the optimal use of desk-top computers which are widely available in Dar-es-Salaam.

The industrial sector has received similar, though less extensive attention. A. YUDIN and M. EL-TOUKHY [1986] from UNIDO wrote against the background of the Industrial Development Decade for Africa the (IDDA) and took particular account of the special concern of the Lagos Plan of Action (1980) in identifying particular sectors in which the supply of national information was crucial for the success of the IDDA. The report indicates that many African countries have no industrial information system and where they exist, they are inadequate in scope and orientation. They also lack the resources to obtain information from external sources on a systematic basis, in particular from the Industrial and Technological Information Bank (INTIB) which was established in 1980 "to facilitate and accelerate industrial and technological information flow to developing countries for the selection of alternative technologies and equipment and to reduce the preparation time of feasibility studies".

A similar report was written on Zambia's industrial sector by the two consultants. Both reports examine existing information infrastructures for the sector and assess the national focal points of INTIB. They recommend training personnel for data input into the INTIB system and related areas.

ii. Ethiopia

According to Kebreab W. GIORGIS [1976], a UNESCO mission undertaken by W. PATON reported on a long-term plan for a nation-wide development of public and school library services in Ethiopia. It also made recommendations on the focus of the National Library's functions, including that serving as the headquarters of the central public library in a country-wide public library system. E. TIKU [1985] views the inefficient services offered by information systems as justification for the decision by the Ethiopian Science and Technology Commission (ESTC) to request UNESCO's assistance in studying the basic requirements for setting up and implementing a scientific and technological information system. Several reports were issued between 1975 and 1987.

Establishment of a national scientific and technological documentation centre (1975) - responded to the terms of reference which included:

(a) Evaluation of the existing resources;
(b) Identification of national needs of STI;
(c) Drawing up a plan for a national STI Centre; and
(d) Costing the plan.

The report recommended short term training programmes to develop specialized personnel in information science and the establishment of a focal point to link the national system with external ones.

S. PARTHASARTHY [1978], another UNESCO Consultant, surveyed existing STI facilities in Ethiopia and recommended the establishment of a national STI system - the Ethiopian Scientific and Technical Information System (ESTIS) - as "a matrix for bringing together the scientific and technical information activities in a functional network" [p. 45]; ESTIS should then formulate a national STI policy. TIKU refers to a subsequent survey [1983] to update PARTHASARTHY's report which had not been implemented and which recommended a seminar to highlight major issues involving the planning of an Ethiopian Scientific and Technological Information System; to review and assess existing information and documentation services; to formulate proposals for the promotion of a national information policy and plan for Ethiopia; to define project areas and consider the establishment of a permanent co-ordinating mechanism. These recommendations embody important policy considerations.

M. N. SEETHARAMAN [1987] writing in the context of current discussions on the relationship between STI, national information policy and national development planning, recommended the need for government commitment to and support for a national STI policy. This is in line with the recommendation of the Vienna Plan of Action (1979) of the United Nations Centre for Science and Technology for Development (UNCSTD), that information policy be "an integral part of the overall national development plans..."

In 1984 SAREC produced a report carried out jointly for Ethiopia and Tanzania on a model STI centre for small research and development systems designed for developing countries, but with special relevance to the countries concerned.

iii. Kenya

The proposed rationalization of the agricultural research sector of the Kenyan economy had led to a recent survey of the sector by N.W. POSNETT. His Report (1987) recommends the reduction of the number of national agricultural centres from 46 to 31 and the establishment of a new, hierarchical, basic structure. He makes no detailed policy recommendations on information in that sector. The recommended mergers of old agricultural research and development structures into a smaller number of parastatals, however, should result in equally rationalized information resources, thus providing a model for other sectors in the future.

The survey also involved a critical examination and evaluation of the various libraries and documentation centres attached to the agricultural research institutions. Nine of the twenty-one recommendations were devoted to improving the information and documentation support systems in terms of staffing, finance, stock development and management, accommodation, etc.

b) Survey of Specific Institutions

i. Ethiopia and Kenya

John WALFORD, a UNESCO consultant produced a report in 1984 reviewing the Kenya National Archives. A.W. MABES [1982] undertook a similar mission on the Ethiopia National Archives and the report recommends a three-phased plan of short-, medium-, and long-term, whilst also drawing attention to the need for legislation, for an Advisory Council for staff training. WALFORD's recommendations for Kenya include, the definition national archives functions, management structure and staff training and status. Both of these reports should form valid bases in the formulation of national information policies on archives.

ii. Seychelles and Mauritius

Marie Consuelo BENOIT refers to two earlier reports commissioned by UNESCO in 1976 and 1977, on the development of libraries, museums and archive services. These were written by Francis Otiano PALA and

K.C. HARRISON respectively. PALA's terms of reference included the development of "a plan for a national information policy in Seychelles" and the development of a Seychelles National Library.

HARRISON's mission was to assess "the present situation of library, documentation and archives services, to discuss with the authorities the future prospects for library development and to lay the foundation for a workshop for library assistants designed to be held during August, 1978". BENOIT reports that Harrison undertook a similar mission in Mauritius.

F. REGIONAL INITIATIVES

a) Conferences

African countries now accept the importance of establishing viable information and documentation systems. Thus conferences and seminars have been convened which have brought together information professionals, researchers, academics and policy-makers to consider the problems of access to information and the need for policy to provide direction in this effort. Attempts have also been made to establish regional information systems on a co-operative basis similar, for example, to EURONET, the European On-Line Information Network, which aims to make accessible to each country in the region the information resources of all.

Scott ADAMS and Judith A. WERDEL [1975 p. 315] note the significance for the African region as a whole of the CASTAFRICA Conference, organized by UNESCO (Dakar, Senegal, 1974), to review national policies on science and technology for development. Many references were made at that conference to the need for compatible information services and systems.

GEHRKE also explains that the aim of CASTAFRICA was to assist UNESCO member States to set up the necessary programming machinery and institutions to effect a national policy for science and technology [p. 171], in which context alone a national information policy was considered possible.

The Lagos Plan of Action [1980], the policy document of the Organization of African Unity (OAU) for Africa's economic development and self reliance, recognizes the essential role that information should play in project execution in every sector of the national economy. It, therefore, enjoins African countries, as a matter of policy, to provide an information component for every sector of the economy in their development plans, based on the needs of that sector and those immediately related to it. It urges African countries to plan for and set up national information systems to ensure ready access to decision-making information. The importance of information in national development runs through the entire document.

The Joint Conference of African Planners, Statisticians and Demographers (Addis Ababa, 1988) resulted in the publication of two documents which are interesting examples of rare statements by African administrators and policy-makers of their information requirements, type of information required and the mechanisms for its generation and dissemination. The documents, entitled: "Improving information flows on the follow-up process to African economic recovery and development"; and "Issues on information and monitoring", are a response to the information requirements of the United Nations Programme of Action for Africa's Economic Recovery and Development (UN-PAAERD). They represent a new and positive approach to information policy which augurs well for future relations between policy makers and members of the information profession.

The Report of the Information Experts Meeting held in Harare, in 1985, is important for its emphasis on information personnel training. It focused not only on Africa's chronic shortage of information professionals, but also on existing training institutions and their responses to the labour problem. Garth GRAHAM addresses the need for institutions to meet the urgent demand for specialist, information managers for the documentation and information centres being established within the Southern African Development Co-ordination Conference (SADCC). The proposed information science school to be based at Addis Ababa University is seen as a response to similar need.

An important outcome of this meeting is the series of handbooks (now in three volumes) on teaching and learning materials which are designed "to bring all professionals closer to the user". They comprise articles covering the entire spectrum of the information discipline in the sub-region.

The report of an earlier conference, the Meeting on the Introduction of Information Science into Library Training in East Africa, held in Dar-es-Salaam in February 1980 and edited jointly by S.A.N.ABIDI and Ties MOELLER also addressed the need for the curricula in library schools in Eastern Africa favour information science, in order to meet the growing demand for professionals. The report was accepted as a guideline for the development of East African information training.

Harmonizing information studies training programmes was the subject of a meeting of African educationists in information, convened in Bonn in December 1987, under DSE sponsorship. The meeting followed the London Colloquium and IFLA Brighton Conference which discussed the subject at a general level. The proceedings review comprehensively the curricula and course content of library and information training institutions on the continent. They recommend that training programmes in librarianship, archives and documentation should be harmonized to avoid duplication of work, wastage of resources and isolationism in these closely related professional areas, bearing in mind that integrated library and information systems form the basis of current African policy initiatives.

b) Regional Networks

R.S. MABOMBA [1983] discusses some of the initiatives in the Eastern and Southern African sub-region towards a regional information network, with its implied principles of the sharing and co-ordination of resources. He mentions the International Conference on the Development of a Documentation and Information Network in Eastern Africa, Nairobi, Kenya 24th July - 1st August, 1973 (the NAIROBI CONFERENCE), the establishment of the Pan African Documentation and Information System (PADIS) at the headquarters of the Economic Commission for Africa (ECA) in Addis Ababa, Ethiopia (January, 1981) and the PADIS First Consultative Meeting of Information and Documentation Scientists, Policy-Makers, Researchers and Experts on Technical Co-operation from Southern African Governments (Harare, Zimbabwe, 22-26 February, 1982), at which the discussions on the formation of a Southern African Documentation and Information system (SADIS) were finalized.

i) The Nairobi Conference (1973)

This conference represents the first step in Africa towards the co-operation and co-ordination of information resources to maximize their use. MABOMBA and GEHRKE mention the establishment of a regional co-ordinating agency, the Regional Committee/Council for the Development of Information Services in Eastern Africa, which was later (1975) "expanded to include almost all countries in Eastern and Southern Africa.

Of the Council's eight objectives listed by MABOMBA, which reflect its co-ordinating role in the proposed regional information network, two were of special significance. The first was to respect participating country's socio-political and ideological orientation, which will inevitably form the basis of the national information system. The other was to accept that national funds would have to be committed to the maintenance of the regional system, although international funding would be solicited and an international perspective maintained.

GEHRKE also refers to the Nairobi Conference (and the KAMPALA Meeting of 1970), but emphasizes its national focus by making particular mention of the resolutions calling for the creation of National Documentation Centres and National Co-ordinating Bodies.

ii) The Pan African Documentation and Information System (PADIS)

PADIS is the first African-wide system established on an intergovernmental basis. Several authors discuss its operation and significance. GEHRKE explains its operational objectives of providing access to information for policy-makers, technicians and planners engaged in the social and economic development of African states. MABOMBA's treatment of PADIS is brief, but it does, however, provide a list of objectives, two of which address the issues of the readiness of African member States to participate in PADIS, and the latter's standardizing and co-ordinating role. Dejen ABATE [1986] discusses the major obstacles to the improvement of Africa's information services and their removal in the context of PADIS which was established to strengthen the information infrastructures of African states and encourage the formulation of national information policies to enable meaningful participation in the PADIS programme.

By far the most comprehensive and objective appraisal of PADIS is that by W.O. AIYEPEKU [1983] who focuses on the critical shortages of information infrastructures and materials that led to the decision to establish the PADIS project. He explains the objectives, structures and functions designed to address these issues and the expectations under which PADIS operates. He strongly recommends that IDRC and ECA identify a few "carefully selected" countries and sub-regions in Africa and give them technical and financial support as "cornerstones" of the PADIS network, and that a training policy should be evolved by PADIS to utilize human resources in information science in Africa to teach DEVSIS methodologies and applications at both sub-regional and national levels.

iii) The Southern African Documentation and Information System (SADIS)

A major development on the Southern African information scene and one designed in response to some of the above-mentioned recommendations was the unsuccessful attempt to establish SADIS as a sub-regional component of PADIS. It aimed for national information systems co-ordination at the sub-regional level, as a back-up or sector of SADCC. MABOMBA records the "Birth of SADIS" at the "First Consultative Meeting of Information and Documentation Scientists, Policy-Makers, Researchers and Experts on Technical Co-operation from Southern African Governments" convened in Harare, Zimbabwe, from 22nd to 26th February, 1982. He states the intended purpose of SADIS to serve the countries of the sub-region by identifying and collecting information generated within the region and by stimulating information sharing and co-ordination among member states [p. 6].

The intensive and far advanced preparation for SADIS ceased suddenly in 1984, although the abandonment of the project was never publicly announced. Private discussions and speculations have not been lacking. **MAZIKANA** suggests that SADIS "floundered amongst nullified and over-turned decisions and amidst a lack of supporting national structures capable of maintaining the momentum" [p. 177]. He puts it forward as an object lesson to those who attempt to establish sophisticated regional information networks without first ensuring the existence of viable national information services. Of greater significance perhaps is the political dimension which brought about the reversal of decisions.

MAZIKANA refers to arrangements to revamp SADIS into ESADIS - the Eastern and Southern African Documentation and Information System - to be based in Lusaka, Zambia. The various documents that were prepared in relation to ESADIS should prove useful to this project.

In his presentation of IDRC-IS programme directions, Garth GRAHAM (1985) explains that the promotion of co-operative regional information systems is a priority with IDRC and that it is only after these have been established, the standards developed and technological solutions to compatibility problems have begun to emerge that IDRC'S Information Sciences Division turns its attention to the national level [p. 143]. In the regional context, he mentions IDRC sponsored systems such as the International Livestock Centre for Africa (ILCA) and the International Centre for Research in Agro-Forestry (ICARF), which are the result of this deliberate "top down" approach.

G. NATIONAL INITIATIVES

National information policy formulation can only be undertaken by the countries concerned. **MONTVILOFF** [1987] rightly observes that policy depends on a country's information requirements, which are themselves subject to the major national development goals. He also maintains that outside assistance can only take the form of the creation of an awareness of the importance of action in this direction by policy-makers, through supportive rationale IDRC, DSE, UNESCO and other aid donors have been assisting in this way since the early 1970s.

a) Conferences, seminars and surveys

In many of Eastern and Southern African countries action to improve the policy environment is increasing. The immediate catalyst was the UNESCO/IDRC-sponsored Seminar on Resource Sharing in Southern and Central Africa, held in Dar-es-Salaam, Tanzania, on 16 to 19 December 1985. The seminar report emphasized again the importance of resource-sharing among SADCC countries but points out that for this to be effective, the national capabilities in each member country should be strengthened. To this end, in October 1986, UNESCO surveyed four countries of the sub-region; Botswana, Malawi, Zambia and Zimbabwe.

The formulation of a national information policy was identified as a priority "as it provides the legal framework for co-ordinated development and management of national information resources".

The account given above provides the background to on-going activities on information policy in the sub-region. UNISIST NEWSLETTER [Vol. 14, No. 2, 1987] reports quite extensively on three seminars on national policy for library and information services held "within the framework of the development of information resource sharing activities within and among countries, members of the Southern African Development Co-ordination Conference (SADCC)" which met in Zambia, Zimbabwe and Malawi from 23 to 27 February, from 25 to 27 February and from 4 to 6 March 1987 respectively. The main objectives of the seminars included the formulation of a basic policy statement and its endorsement at the highest possible level and the setting up of a policy procedure.

Three reasons are given for holding the seminars, the 1985 Dar-es-Salaam seminar, the consultancy carried out by Made and the SADIS feasibility study of 1982-1983. Zambia and Malawi put forward draft proposals and/or modalities for a national information policy as a direct result of these meetings. Zimbabwe established a National Documentation System. Under DSE sponsorship and as essential initial steps towards the formulation of a national policy Botswana held two workshops; the first on the Establishment and management of a national information service held in Gaborone on 23 to 27 February 1987 and the other in July 1987, on the need to establish a national co-ordinating agency.

Even those countries that have not yet prepared formal draft policy statements have held conferences and symposia, some directly on policy, others to discuss general information problems which can only be solved by a national information policy. Evidence of such policy-oriented activities exists in the following: the Mbabane and Maseru Workshops (February and March 1986) on the co-ordination of information services in Swaziland and Lesotho respectively and the "Proceedings of the Ethiopian evaluation and analysis seminar on national scientific information policy and plan" (April 1984). A "Seminar on Namibian Bibliography and Documentation" was convened in November 1985 to lay the groundwork for a future information policy and system.

b) Professional Opinion

At the individual level, information personnel have made strenuous efforts, but with limited success, to point out to governments the various problems that make library and information systems ineffective and unable to deliver information correctly. F. INGANJI [1983] undertook a survey of the status of libraries and information centres in the countries of the Eastern and Southern Africa. His general observations on service performance are that basic information systems, such as academic and public libraries, archives etc., exist in the majority of the countries surveyed. These are modern information centres, but they do not perform well due to the well-known infrastructural weaknesses of insufficient manpower, inadequate training programmes, indifferent funding, lack of co-ordination, narrow inward looking attitudes and inadequate government support, all of which he attributes to the absence of information policies in the countries. Similar sentiments have been expressed. Maurice LUNDU [1983, 1984, 1985] and C.B.M. LUNGU [1985] of Zambia: MCHOMBU [1984] of Tanzania; MUSISI [1981] and OTIKU [1985] of Kenya; and R.S. MABOMBA [1983, 1984, 1987] of Malawi, have all tried to point out that information is an essential resource that needs exploiting for national development. The responses from policy-makers have varied from country to country, but the general picture of indifference at the policy level is pervasive.

The absence of impact has been attributed to a lack of professional clout among information professionals. GEHRKE sees the low priority accorded to the information profession and its practitioners in Africa in this context, as indeed does ABATE. GEHRKE's explanation is of an inferiority complex resulting from the unequal educational levels between librarians and those in the higher echelons they serve. This may not be true in all cases, but there is a tendency to employ untrained staff in libraries and information centres. Critical comment in the professional literature certainly bears this out. So too does the trend of training institutions to over produce non-graduate diploma holders, as commented on by J.R. NEILL [1985, p. 23].

GEHRKE feels that, this discrepancy precludes competent discussion between supplier and user of information which in developed countries often prepares the ground for continued partnerships [p. 183]. Lack of appreciation of library and information work may be a contributory factor [p. 189], but Garth GRAHAM [1985] blames the inability of information experts in the region to meet the acknowledged challenges through problem-solving discussions.

There is no shortage of references to discussions of major defects in the performance of information systems and services that require a definite statement of information policy to redress them. INGANJI predicted the inevitability of the development of national information policies and the establishment of national documentation centres in the sub-region. He based this observation on the fact that growing recognition of the importance of information as a national resource highlighted the obligation to make it more readily available.

c) Co-ordination, Co-operation and Resource Sharing: Central Issues in Information Policy and Systems Effectiveness

Effective co-operation through co-ordination of effort is a basic precept of the UNESCO information programme since national self-sufficiency in information in the modern world is neither possible nor desirable because of the volume and cost of information. Resource sharing would ensure the availability of national and world-wide information at a fraction of the cost of each country endeavouring to acquire them individually.

This viewpoint has been accepted since the Nairobi Conference of 1973. More recently the Dar-es-Salaam Seminar (1985), the joint Mbabane and Maseru seminars (1985) and the Gaborne Workshop (July 1987) have all reiterated the same theme.

The discussions, however, have taken place in situations where sharing and co-operation have had little impact because they have neither been formalized nor co-ordinated. The literature is full of references to such situations.

E. SAMAHA [1976] draws attention to the wasteful duplication of effort that can result from a lack of co-ordination, in the report on a mission to Tanzania in 1976, to study the application of scientific and technological information in development.

Marian CHIKAWE said it all in relation to Tanzania in her presentation for the Certificate in Librarianship.

Both this and Francinah Matseliso THABISI's [1983] review of co-operation in Lesotho suggest a growing tendency to use the co-operation and co-ordination of information resources as a topic for academic essays in library schools. Thabisi examines the seriousness of the lack of co-operation and information sharing in Lesotho; points out the benefits to be derived from it and concludes predictably by recommending that only a national information policy with legislative backing can ensure its effectiveness.

QOBOSE [1985] writing on co-operation in Botswana concludes that there is none. Thus, the July 1987 seminar can be seen as a response to the need for institutionalized co-ordination in the context of information policy formulation. The principle of networking as expressed in the reports on the seminars in Botswana and Zambia (1988), have co-ordination as an important foundation stone and resource sharing a major objective.

d) Recent National Action or Statements in the Direction of Policy

Efforts have been made by some countries of the sub-region to formulate information policies in accordance with NATIS, while others reflect a combined NATIS/UNISIST approach, in their sectoral orientation to integrated systems. This is borne out in conference papers and articles.

i. Zambia

The reports of two fairly recent conferences on national information policy show the heightened consciousness of the need for guidance for the country's information programme. The seminar held in 1985 was specifically on the need for a regional policy and the 1987 conference was convened to formulate such a policy which is contained in the "National Information Policy for Zambia: Draft Proposals" (1987).

Under the influence of M.C. LUNDU [1984, 1986] Zambia's approach has been NATIS-oriented, since the declared role of NATIS was to assist in the establishment of information systems in member States which will ensure that information is available to those engaged in developmental activities in all sectors of the national economy.

Thus the Draft policy proposals enshrine the following principles:

(a) Information is one of the national issues crucial to development.

(b) A national information policy should identify and define major areas of information need (in the context of the major objectives of the national development plan).

(c) The policy statement should commit the state to provide the proper environment and the means for meeting identified needs.

(d) A national information policy will ensure planned, co-ordinated and strong infrastructural capabilities as the basis for co-operation and resource sharing at all levels.

The Draft is in two major parts. Part one deals with the importance of information as a national resource and justifies exploitation in line with other resources; gives a brief survey of the state of the information infrastructure and considers the major socio-economic sectors and their information requirements.

Part Two consists of the proposed policy statement; the aims or objectives of information policy for Zambia; then the actual policy proposals and suggested strategies for their implementation; followed by a brief conclusion.

The document makes provision for the all-important central co-ordinating agency - the Zambia Advisory Council on Library and Information Resources (Zaclir) - which is expected to formulate the final policy, present it to government for consideration, and if adopted, ensure that legislative support is included and, oversee its implementation.

This is a library-oriented set of proposals in which an integrated system is implied rather than stated. In spite of references to "the network", there is no indication of the structure of the proposed system. The relevance of the new technology is recognized, but not its full impact and dimensions, as only the applications are dealt with and those not in detail.

On the whole, the document is a brave attempt, particularly bearing in mind the Zambian history of failed presentations to Government.

ii. Botswana

The Botswana draft is not on national information policy specifically, but on the establishment of a National Co-ordination Agency which would formulate the policy proposals for Government consideration and approval. The proposals are contained in a report on co-ordinating information services in Botswana. The circumstances that led to the decision to create this body have been explained already in the regional context. The report of the 1987 conference explains that the SADIS proposals necessitated the creation of a national committee to liaise with SADIS. An ad-hoc Information Co-ordinating Council (ICC) created at the time was formalized into the Information and Documentation Co-ordinating Council (IDCC), to formulate a national information policy. Its activities, including two conferences on policy, both in 1987, resulted in the decision to form a committee to discuss the setting up of a co-ordinating agency.

The document presents the background and reviews the present information scene before giving a justification for establishing a council, and setting out its objectives, functions, structure, focus and financial requirements. It concludes with recommendations.

This is a different approach from other national initiatives in the sub-region. Efforts are concentrated, first and foremost, on the creation of the co-ordinating agency, although the functions set out inevitably embody policy proposals. The actual policy guidelines for the attention of government will constitute a second stage in the total effort.

The system suggested is biased towards libraries and institutions dealing with written information, so that disproportionate emphasis is given to publishing and the publishing industry. The present narrow definition of information (a deliberate decision by the Drafting Committee) excludes the full integration of the new technology, although its increasing application and impact on the society is recognized.

iii. Kenya

Kenya has also taken serious steps towards evolving an information policy, and the need for a developed system of documentation and information has been clearly stated. GEHRKE records that he witnessed personally this awareness in 1973 and he refers to a number of ground breaking works by librarians and development researchers in Africa generally and Kenya in particular. He mentions three conferences, including the Nairobi Conference of 1973 which all brought together professional information producers and users in an attempt to bridge the gap between them and initiate co-ordination of information resources in Eastern Africa.

MUSISI [1983/84] provides a comprehensive view of the development of libraries and information services in Kenya, highlighting not only the weaknesses and problems, but also providing a picture of attempts to establish viable infrastructures on which an information policy could be based.

J.M. OTIKE [1986] suggests that the ultimate solution to the problem facing special libraries lies in the formulation of an information policy with the necessary machinery to co-ordinate all information activities and resources in order to avoid duplication and under utilization.

The surveys by J. WALFORD [1982] on the Kenya National Archives and N.W. POSNETT [1987] on the agricultural sector, pointed out the need for co-ordination within the framework of a national policy, as the only means of combatting the constraints on the effective provision of information for development.

A response to this call is to be found in the proceedings of a committee formed by the Kenya Library Association which was mandated to design a national information policy for the country. The Committee which was composed solely of librarians, finally declared itself unequal to the complex task, but it assembled considerable information from operational national information policies in other countries, such as Jamaica.

The latest attempt to formulate information policy in Kenya has resulted in a most interesting draft statement, National Scientific Information Policy, which was prepared in February 1987, by the Committee on Documentation and Information of the National Council for Science and Technology (NCST).

The policy objectives are stated in relation to the fact that Kenya has no comprehensive integrated information and communication policy, but that there are sectoral policies, which relate mainly to the mass media and telecommunications.

Whilst an integrated policy for the whole country is necessary, it is felt that one comprehensive national information policy is not practicable because it would be too unwieldy. Thus, a multi-sectoral, modular approach to policy formulation is presented in a draft policy statement different in its comprehensiveness and complexity of structure from all others examined in this study. It combines all institutional and other information services on the basis of autonomous sectors interlinked in a computer-based network, with District Information and Documentation Services and a national system to provide access to the entire national store of information, through comprehensive bibliographical services and document delivery systems.

Two different national systems are advocated: the overall scientific and technological information (STI) system in all the sectors of the national economy, including natural and physical sciences, social sciences and humanities, and a parallel system of District Information and Documentation Centres (DIDC) linked administratively to the STI. The DIDCs were evolved by the Ministry of Planning, in response to the government's strategy for a district focus for rural development.

The proposed system has major implications on human and financial resources. POLINIERE observes that the centralization of functions is necessary to maximize the use. The need to bring resources closer to users is recognized, but expert opinion suggests that this trend should become prominent only as the country and its information systems develop. Centralization is necessary, or at least, decentralization should be limited to the capabilities of scarce resources.

iv. Tanzania

Tanzania is the only country in the sub-region that has developed a national policy on libraries. It is a straightforward and authoritative statement of government policy with a comprehensive view of library provision and development, from village to university level, in which traditional library functions are intermixed with those of documentation services. The demands of modern research and development activities for the rapid flow of information are taken into account and thus brief mention is made of the new technology and its effect on the information handling.

The policy covers national libraries only to the exclusion of the private sector and archives. It is based on a survey of the current situation in libraries, backed by impressive statistics.

The document defines the obligation of libraries to satisfy identified basic needs in education, research, entertainment, culture and patriotism. Definite directives are given for fulfilling these needs and libraries in Tanzania are called upon to contribute to this effort through co-operation, resource sharing and dedication to duty.

Provision is made for co-ordination at two levels. First, the Tanzania Library Services Board (TLSB) is responsible for supervising and co-ordinating public library services, establishing a national library and developing the National Central Library in accordance with Act No. 6 of 1975 which set up the Board.

Secondly, there is the National Advisory Council on Libraries which "shall be the main advisory and co-ordinating body between the Tanzania Library Services Board and other libraries" in seeking ways and means of developing libraries in Tanzania.

The policy is to be implemented by the Ministry of National Education (which is also its author), through the Tanzania Library Services Board, but since other organizations have full powers of building and developing their own libraries, the Government expects these organizations to take some initial steps in implementing the policy [p. 33].

This document was completed before the Dar-es-Salaam Workshop on Resource Sharing (1985), but whether this had any effect on its final promulgation is not known.

v. Uganda

Uganda's efforts to establish national information policy are praiseworthy in view of the country's political and economic turmoil. Development in every sector of the economy was brought almost to a stand-still until recently.

ABIDI and KIYIMBA, already cited, testify to this and Kate WOOD [1986] refers to a scene of desolation in her report of a survey sponsored by the British Council on education and manpower training in Uganda. The determination to resuscitate the country's reconstruction effort should be viewed in this light.

A seminar on the role of information in the reconstruction of Uganda held in 1987, recommended the formulation of a policy for a national, integrated information system. Other recommendations included the need for information to be part and parcel of the country's national development plans and legislative support for information institutions.

As a result, the existing National Information Agency Advisory Committee (NIAAC) was charged with working out proposals for national information systems and structures and with their submission for Government discussion and approval.

The proposed system is based on the NATIS concept. A three-level structure of libraries, documentation centres and archives is suggested without any sectoral preference and with clearly defined functions. Legislative support is proposed: under a NATIS Governing Body (the Co-ordinating Agency), responsible to the Minister of Public Service and Cabinet Affairs. The Secretariat would be located in the office of the President.

This is a library oriented system and there is no provision for computer-based information systems, although specialized information centres are envisaged. This approach is suggested in the 1987 seminar proposals, because of the lack of exposure of Ugandan librarians and of equipment, qualified manpower, funds etc.

The information policy guidelines, according to the draft, are based on the priority needs of Uganda in the areas of scientific, technological and management resources. They assist Government to decide on how Uganda's priority needs in information can be satisfied within the available resources.

The Committee has, therefore, suggested a policy on the basis of and in conformity with UNESCO guidelines:

(a) Elaboration of a national policy;
(b) Application of norms and standards;
(c) Development of information handling capability;
(d) Training of information manpower and users.

These form the focus of the national information policy and also constitute the main thrust of National Information System activities, which have been worked out in considerable detail.

vi. Malawi

According to R.S. MABOMBA [1983], the Intergovernmental Conference on the Development of Information Services in East Africa, held in Arusha, Tanzania, provided the impetus for the development of documentation activities in Malawi within the NATIS Concept. It also led to several decisions and activities on strengthening the creation of a NATIS Committee to set up a co-ordinated system of library and information services.

Malawi was also an active member of the Council for the Development of Information Systems and Services in Eastern and Southern Africa set up by the Nairobi Conference (1973), whose objectives included fostering resource sharing and promoting the recognition of the importance of information in the region.

The country participated actively in the preparations to establish SADIS and liaised with the SADIS secretariat through the NATIS Committee. At the Zambia Network Seminar, held in Lusaka in February 1988, J.J. UTA [1988] put forward the present picture in a paper in which he identifies the institutions in Malawi which will participate in a future network.

The background of sustained professional activity provided a national framework for the accelerated regional information activities of the 1980s. In consequence, a Seminar on national policy on library and information, was held in Lilongwe in 1987, which set out the draft proposals, laid the foundations and initiated the procedures for formulating a national information policy.

The seminar identifies specific goals and policy issues, chief among which was the optimal utilization of information and professional knowledge in planning, decision-making and problem-solving. The policy format adopted is similar to that of Zambia and reflects the direct input of UNESCO. An element of policy is identified, followed by the means for its implementation.

In other respects, however, the Malawian approach is different for:

(a) No formal committee was appointed to undertake the exercise since the seminar papers provide the background, and the participants represented, in effect, a "drafting committee".

(b) The seminar recommendations constitute the draft proposals.

(c) There is no structured background information, since the various seminar papers comment on aspects of the library, archives and information. This absence may be inconvenient and irksome to the policy-makers to whom the proposals are addressed.

(d) A co-ordinating agency is suggested, but its place in the administrative structure, membership, structure and functions are left for future discussion.

This is a library-oriented set of proposals which states its objectives clearly. It does little more than lay the foundation and initiate the procedures for the formulation of a national policy, for no specific details exist at this juncture.

vii. Ethiopia

The concept of a national integrated information system on the basis of clearly defined policy guidelines is a new phenomenon to all sub-Saharan African countries including Ethiopia. Even though there is currently considerable activity to improve the situation, Mengsteab ADHANA [1985] points out that various libraries, archives and documentation centres "have not been embraced by a national system along the lines of NATIS" [p. 29]. He explains that it is not information work that is lacking, but rather clear policy and concerted action. He refers to several UNESCO consultancies and seminars, including "A National Information Policy Plan" (1984) as means of achieving that goal.

K. TIKU [1985], although more concerned with scientific and technological information, also describes a rather depressing picture of research and development activities serviced by ineffective traditional libraries, in a context of inadequate trained personnel and limited financial and other resources.

Nevertheless, there is evidence of steady progress towards the establishment of a national information policy which will provide a framework for the STI system planned by the Ethiopian National Science Commission. This has been the focus of the many UNESCO consultancies referred to above.

Many of the recommendations of these consultancies and seminars have not been implemented, or have only been partially implemented, but they provide valuable background material on information policy and systems. SEETHARAMAN used these materials during his recent survey of 1987. The 1978 survey by PARTHASARTHY on the establishment of a national STI centre and system for Ethiopia made particularly important policy recommendations which were reflected in those of the 1984 national policy seminar. These included the establishment of a national information policy on the basis of the UNISIST GUIDELINES by WESLEY-TANASKOVIC [1985] and the setting up of a national co-ordinating agency (she presented a summarized version of the Guidelines as her input at the 1984 seminar). The Ethiopian Science and Technology Commission (ESTC) was nominated to be that agency in 1986. Since then ESTC has been much involved in current initiatives in policy development and the establishment of a national information system. The report of the recent "Survey on Library and Documentation Activities in Ethiopia" [1987], initiated by the Commission, has as some of its objectives:

(a) to design a national science and technology information and documentation service; and,

(b) to help provide the required information for science and technology information policy formulation.

A national STI policy depends on a science and technology policy. A Conference organized in June 1988, in Addis Ababa, discussed the possibility of formulating a policy for science and technology. The conference working papers including one by TEFERI, "A Survey of Scientific and Technological Information Services in Ethiopia" [1988], with results from the ESTC survey of the previous year.

The recommendations of SEETHARAMAN's Report [1987] have resulted in the establishment of the National Scientific and Technological Information and Documentation Centre (NSTIDC) in Addis Ababa, with computer and photocopying facilities, jointly funded by UNESCO and UNDP.

The recognition and appreciation of the relevance of the new technology to their systems is an important position taken by Ethiopia. TIKU identifies the "choice and applications of foreign technology on the best possible terms, to contribute to national gains in technological development" and the "capacity to adapt and improve technology" as among the important elements in scientific and technological capacity building. SEETHARAMAN also says in his report that his terms of reference included conducting:

> "a training course on information handling techniques and computer-based information systems for the benefit of personnel working in these areas in the Commission and in other Government Departments and Agencies".

Thus, although Ethiopia has not yet produced a definite information policy document, serious preparations are underway in that direction.

viii. Zimbabwe

Zimbabwe has no national information policy, the report on information and documentation capabilities survey conducted by the now defunct Southern Africa Development Information / Documentation Exchange (SADEX) notes that Zimbabwe was among the first countries to seek assistance from PADIS in developing a national scientific and technical information centre [SADEX, March/April, 1981, p. 17]. MAZIKANA (1987) notes that Zimbabwe established a National Library and Documentation Service (NLDS) in 1985 following the workshop of March 1985, which is regarded as "a significant step forward" towards the eventual formulation and execution of a national information policy [pp. 171-172].

ix. Swaziland and Lesotho

Swaziland and Lesotho have no definite policies and by implication, no co-ordinated and integrated national systems. They have, however, been active participants in recent professional activities in the sub-region. The reports of the various DSE sponsored seminars mentioned elsewhere testify to a systematic attempt to diagnose and solve the major problems affecting library and information fields.

In a paper presented at the Botswana Workshop [1985], M.M. NHLAPO (Swaziland) observes that the recommendations from two previous workshops show Swaziland's needs in setting up a national information service, foremost of which is a national information policy.

Lesotho, is now reported to have a National Information Liaison Committee, which could perhaps presage a co-ordinating agency, which has conducted a survey on library and museum services in the country (1983). This indicates some action in the direction of integrated services and policy considerations.

H) CONCULSION

a) General Conclusion

African governments are now reasonably aware of the importance of information and the need for policies to ensure its full exploitation for national development. Concrete policies are emerging. The extent to which the relevance of the new technologies is recognized, however, varies from country to country and in most cases it is not given a high profile.

However much concerned policy-makers are with establishing guidelines for basic systems, there is nevertheless considerable awareness of the need not merely to design ways of coping with information but also to strengthen societies against the technological onslaught, through endogenous systems with the same technological base, acquired by means of external assistance. It is an example of the development dilemma that African countries have yet to solve.

b) Specific Comments and Recommendations

Various policy issues that are discussed in the professional literature have been mentioned in the preceding study, some in detail, others only in passing or indirectly. The following comments and recommendations are made to suggest areas of special consideration and action in the immediate future.

i. Research into Professional Policy Issues and National Information Requirements

To be effective, an information policy should be based on the identified information needs of the various sectors of the national economy, as well as on the articulated problems of the information community. There is a dearth of empirical investigation into any of the above parameters. Much of the available literature consists largely of descriptive surveys which do not propose realistic solutions.

Thus it is recommended that:

(a) Problem and action-oriented investigations into the information requirements of specific economic sectors and into the deficiencies of existing information services preventing effective performance should be undertaken, so that purposeful planning can be effected.

(b) It is particularly recommended that joint teams of information practitioners and academics should research such specific problem areas as:

Training

- The relevance of existing training programmes the calibre and performance of the end products;
- Information manpower needs of sectors of society in relation to levels of qualification and areas of specialization;
- The prospects of promotion to professional levels through study for para-professionals;
- Harmonization of training curricula to further the objective of integrated information systems and services;

Improving the image of the information profession and rapport between practitioners and policy makers/administrators;

Research on the need to improve the status, terms of employment and remuneration of information workers;

The information needs of specific groups of people or sectors of the economy (for example rural information systems).

ii. Over-Dependence on Foreign Consultants

Studies are important aspects of information policy determination. The majority of these are undertaken by foreigners working closely with local professionals. The production of these reports is within the competence of local personnel. The preference for foreign experts is symptomatic of the lack of confidence of African administrators and policy-makers in their own national professionals. This aspect of the dependency syndrome needs to be addressed and African administrators must learn to respect the professionalism and expertise of local personnel by using them. This would ensure more relevant and timely reports and would provide opportunities for strengthening local expertise and generate more confidence. PADIS should assist by making available its African experts data base.

iii. Non-Implementation of Report Recommendations

There is much evidence to show that the majority of reports resulting from the feasibility studies requested by African governments are not implemented, for one reason or another. The same applies to conference recommendations. The result is a proliferation of consultancies and meetings which reconsider the same issues. This situation creates the unfortunate impression that the organizations concerned care more for the professional advancement of their staff, than assisting the recipient countries.

African governments should, therefore, endeavour to establish firm priorities and follow up recommendations with action. UNESCO and other donor agencies should establish mechanisms to ensure follow up action on projects initiated or sponsored by them, avoiding wasteful duplication.

African institutions should collaborate to ascertain what reports already exist in related fields before requesting consultancies. This recommendation presupposes the existence of reference material, such as reviews and directories, that would make such co-ordination possible. The responsibilities of the information professionals are obvious.

iv. Legislation

The formulation of integrated national information policy assumes the amalgamation into one single unitary law of existing separate legislation on individual information institutions, systems and centres. This should take cognizance of related national and international copyright law, bibliographic controls, free flow of information and related legislation.

There is firm evidence that existing legislative instruments are inadequate in their coverage of institutions. They are often restrictive and narrow in their provisions and in some countries, are altogether non-existent. The existing book-hunger in Africa and the increasing use of information result in reproduction on a considerable scale that may infringe copyright regulations on author's personal and financial rights.

Thus governments in the region are urged to up-date existing information legislation in consultation with the professional community, so that such laws ensure proper validity and direction for the information institutions concerned. In those countries where information institutions operate without legislative mandate and support, governments are urged to make such provisions as soon as possible.

The acts establishing parastatal institutions should make specific provision for the libraries or information/ documentation centres attached to them.

Governments in the sub-region should endeavour to formulate policies that strike a proper balance between the particular demands of their people for information and the requirements of international copyright agreements.

v. Over-Dependence on Foreign Information Sources

The East and Southern African sub-region is heavily dependent on foreign countries for the bulk of its information. This includes a dependence on South Africa by means of various co-operative measures.

Governments and all institutions interested in information should strive for policies to reduce this dependence in the interest of national self-reliance, security and self-respect. This includes measures conforming to the SADCC objective of reducing dependence on South Africa.

vii. The New Technology

The current preoccupation of the profession is to establish effective national information systems to ensure accessibility at all levels. This is being done in the context of rapid technological changes in the spheres of telecommunications, computers and publishing that are bound to have a great short- and long-term impact on the design and operation of the systems created, and on society. It is also important to take optimal advantage of the enormous processing and storage capacities and new methods of communication associated with computer and telecommunications hardware and software, and to find appropriate applications for them in library and information work.

These matters are not discussed in the literature on information policy except in the Kenya Draft Policy Guidelines. The others mention computers and information technology only in passing and in the limited context of application for library housekeeping purposes. This attitude misses the whole point. The advances and developments in the new technology and their possible uses in and impact on African societies need serious investigation even if they cannot be fully adopted at present. It is only a matter of time before African countries will have to establish computer-based systems, especially in the context of regional and international co-operation, or face the prospect of becoming professionally moribund.

African information institutions should, therefore, ensure that at least the senior personnel are exposed to or have some training in the use of computers in information handling. PADIS should redouble its training efforts in this area. Local institutions could co-operate with the computer companies for short staff training sessions.

Donor organizations should assist in mounting some of these programmes either individually or jointly with regional African institutions such as PADIS or the East and Southern African Management Institute (ESAMI).

vii. Integrated Information and Communications System

Communications, including the media and telecommunications, have not received enough attention in the literature and draft policy documents. Whilst the profession deals with "hard" information, a largely illiterate continent ignores the relevance of the mass media and other means of popular communication at its peril. Radio, newspapers, television programmes and the mobile cinema of Information Services Departments, etc., are relevant in extension and rural education programmes. Telecommunications belong in this age of communication satellites. They should all be part of integrated information systems and the information community should seriously consider their use in enhancing the dissemination of information to the urban and rural masses.

Governments are urged, therefore, to develop or improve existing communications infrastructures including roads, postal and telecommunication facilities and to expand them countrywide.

viii. Overstatement of Information Problems

Since 1980, a great many conferences and workshops have been convened in Africa to discuss the various information problems such as personnel development, resource sharing and co-ordination. Although these are necessary to develop information facilities and ensure the effective use of scarce resources, there is too much overlap and reiteration of old issues.

Conference proceedings should be concerned with and represent the topic under discussion. Country reports should treat only those aspects of the subject which are relevant and not review the entire information situation.

ix. The Private Sector

The current trend towards formal policy guidelines is an encouraging development which should receive support from all sectors of the economy. The private sector has, however, been omitted from official discussions of policy and guidelines. Although indigenous private sector information institutions are rare, multinational organizations dominate all African economies. Thus provision should be made for their representation and input into policy discussions in order to prevent possible future conflicts of interest.

c) Summary of Recommendations

i. Problem-and action-oriented investigations should be conducted into the information requirements of specific sectors of the economy and into professional problems that militate against performance in information production and dissemination.

ii. African administrators and policy-makers are urged to employ local experts in feasibility studies to establish confidence in both directions and ensure relevance of reports.

iii. To ensure follow-up in the implementation of study reports and conference recommendations, African governments should establish priority areas of need; donor countries should ensure that sponsored projects are executed; directories and reviews of ongoing or completed projects and relevant results should be compiled, to avoid duplication.

iv. Legislative backing should be provided for every individual information institution to give it direction and identity. Copyright legislation should strike a balance between the special information needs of African communities and the requirements of international conventions.

v. Existing information legislation should be amended to ensure that new developments, processes and the products of a fast developing information industry are included.

vii. The dependence on external information resources should be reduced, especially on South African sources, in the context of SADCC objectives.

vii. PADIS, donor organizations and computer companies in African countries should assist in providing exposure for African librarians and other information personnel to the use of computers in information work.

viii. Increased use of the mass media and telecommunication facilities should be made to ensure effective dissemination of information to the masses of the people.

ix. The private sector, especially multinational organizations, should be involved in information policy discussions to prevent future conflicts of policy.

x. Government of those countries that have presented draft policy guidelines are urged to examine these seriously and without undue delay, with a view to approving and giving them legislative backing.

xi. Those countries that have not yet evolved a national information policy should be encouraged to do so as soon as possible.

I. REFERENCES

1. ABATE, Dejen. Improvement of national and regional information services: an assessment of problems and solution prescribed under the Pan African Documentation and Information System, (PADIS) programme. in Co-ordination and Improvement of National Information Services: Mbabane and Maseru Workshop papers, Mbabane, Swaziland, 24-28 Feb., 1986; Maseru, Lesotho, 3-7 March, 1986. Edited by Lutz Huttemann. Bonn: DSE, 1986. pp. 78-92. (DOK 1347 A/a).

2. ABIDI, S.A.H. and KIYIMBA, J. The impact of legislation on libraries in Uganda. Libri : International Library Review; vol. 33, no. 2. 1983. pp.113-125.

3. ADAMS, Scott. Information policy for development: national and international responsibilities: main issues discussed at the 1st UNISIST meeting on the Planning and Implementation of National Information Activities in Science and Technology; April 20-23, 1976; Herceg Novi, Yugoslavia. Paris: UNESCO, 1976. 43p.

4. AINES, Andrew A. and DAY Melvin S. National Information Services. Annual Review of Information Science and Technology, vol. 10, 1975.

5. AIYEPEKU, W.O. International socioeconomic information systems: an evaluative study of DEVSIS-type programmes. Ottawa; Canada: IDRC, 1983. 100p.

6. ATHERTON, Pauline. Handbook for information systems and services. Paris; UNESCO, 1977. 259p.

7. AUBRAC, Raymond. National information policies as discussed in UNESCO literature. [Ottawa, Canada: IDRC, Confidential], 1988. 29p.

8. BENOIT, Gaetan. Draft Report prepared by Gaetan Benoit and submitted to the Ministry of Education and Cultural Affairs, [Mauritius] January, 1984. Appendix I. 12p. (Mimeographed).

9. BENOIT, Marie Consuelo. Visit to the Seychelles, April 8 - April 15, 1984: Report to the Deutsche Stiftung fur Internationale Entwicklung, Bonn. 25p. (Mimeographed).

10. BHUSNAN, Ved. Libraries and Librarianship in Swaziland. Annals of Lib. Sc.and Documentation, 27 (1-14). 124-129.

11. BOON, J.A. A national information policy and the South African Institute of Librarianship and Information Science. *S.Afr. J. Libr. Inf. Sci.*, 1984; 52 (1). pp. 15-22.

12. CHIKAWE, Marian A.Problems of Disseminating Information in Documentation Centres in Tanzania; National Library Certificate course 1983/84: Project Paper. Dar-es-Salaam: Tanzania Library Services, 1984. 10 p.

13. CONFERENCE on Resource Sharing in Southern and Central Africa, Dar-es-Salaam,Tanzania, 19th December, 1985: Final Report. Paris: UNESCO/PG1, 1986. 15,3,3p. (PG3-86/PPS/TAN-Z/2; PG1-86/WS/8).

14. CO-ORDINATION and Improvement of National Information Services: Mbabane and Maseru Workshop Papers. Report of the two workshops held in Mbabane/ Swaziland from 24-27 Feb., 1986, Jointly organized by the German Foundation for International Development, the Swaziland National Library Service and the Swaziland Library Association and in Maseru/lesotho from 3-7 March, 1986, jointly organized by the German Foundation, the National University of Lesotho, and the Lesotho Library Association. Edited by Lutz Huttemann. Bonn, DSE, 1986. 232p.

15. DEVELOPMENT networking in Southern Africa: Editorial commentary. *SADEX*, March/April, 1981. pp.7-8.

16. DEVELOPMENT of Documentation and Information Networks in East Africa, 24th July - 1st August, 1973. [Organized by] The East African Academy in co-operation with the German Foundation for International Development (DSE) and sponsored by UNESCO. Bonn: DSE, 1973. (DOK 701 1 ba 11b 5/73).

17. EL-TOUKHY, M. and YOUDIN, A Country Report on the Industrial and Technological Information Systems in Tanzania. UNIDO, Feb. 1986. (UNIDO/15/R.31).

18. ETHIOPIA Laws. Proclamation No. 50 of 1975 Deposit of Printed Materials Proclamation: A Proclamation to provide for the deposit of printed materials in the Ministry of Culture and Youth. Addis Ababa: 1975

19. AN EVALUATION and Analysis Seminar of National Information Policy and Planning, Addis Ababa/Nazret, Ethiopia, 4-7 April, 1974. Proceedings. Addis Ababa, ESTC, 1985.

20. GEHRKE, Ulrich, Information for development. Some problems of national co-ordination, regional cooperation and international assistance. *INSPEL : Official organ of the IFLA Division of Special Libraries.* No. 3, pp. 116-198.

21. GIORGIS, Kebreab W. Planning and organizing public libraries in Ethiopia for the period 1975-2000. *UNESCO Bulletin for Librs*, vol. 30, no. 2, March-April 1976. pp. 78-82.

22. GOSHEN, Carolyn. Report on a Preliminary Information and Documentation Capabilities Survey. *SADEX*. March/April 1981. pp. 14-19.

23. GRAHAM, G. Programme directions of IDRC Information Sciences Division. *In*: Manpower Training Needs. Proceedings and Papers of the Information Experts Meeting, 18-21 March 1985. Edited by Lutz Huttemann. Bonn: DSE, 1985. pp.137-149.

24. HANDBOOK of teaching and learning materials, 3 vols. Lutz Huttemann, ed. Bonn, DSE, 1985-1987. (Librarianship and documentation studies).

25. HOLMBURG, B. FAO Mission to Tanzania to assist in identifying participants in planning for a national agricultural information network, 22 Sept. - 21 Oct. 1982. Rome, FAO. 1982. Within the framework of the Interim Fund for Science and Technology for Development (IFSTD). Project UNO/INT/002/STD.

26. *INTERNATIONAL CATALOGUING* vol. 13, no.3 July/Sept., 1984.

27. IMPROVING Information Flows on the Follow-up Process to African Economic Recovery and Development: Fifth session of the Joint Conference of African Planners, Statisticians and Demographers, Addis Ababa, 21-28 March 1988. p. 19,7,5,5,12. (E/ECA/PSD.5/14).

28. ISSUES in Information and Documentation systems for Plan Preparation. Implementation and Monitoring: Fifth session of the Joint Conference of African Planners, Statisticians and Demographers, Addis Ababa, 21-28 March, 1988. 20pp. (E/ECA/PSD.5/49).

29. KAMBA, Angeline, S.Bibliographic control: Zimbabwe's present practices and hopes for the future. Prepared for the IFLA General Conference in Nairobi, 1984. (Mimeographed).

30. KAUNGAMNO, E.E. Problems and solutions in setting up Library and Information Services in a Developing country - the Case of Tanzania: Paper presented at the Commonwealth Library Association (COMLA) Seminar, 24th Feb. - 2nd March 1983, Nairobi, Kenya. 1983. p. 30.2.

31. KAUNGAMNO, E.E. Possibilities of an integrated national Library policy for African countries [Paper delivered during the commemoration of 25 years of the Ghana Library Board. Accra, Ghana, 22-26 September, 1975]. Dar-es-Salaam: Tanzania Library Board, 1975. 10p.

32. KENYA LIBRARY ASSOCIATION. Ad-Hoc Committee on National Information Policy. Terms of Reference and activities of the Committee. Nairobi Kenya [1986]. p. 8.

33. LUNDU, Maurice. Information Resource Management in Zambia: Implications for National Information Policy Formulation. Paper presented at the International Conference on Information Resources Management, Dubrovnik, Yugoslavia, 1-5 June 1985. p. 12.

34. LUNDU, Maurice. The National Information System (NATIS) concept and the development of libraries in Zambia: Some underlying critical issues. *International Library Review* (1984) 16, pp. 373-385.

35. LUNGU, C.B.M. Library legislation in Zambia: a paper presented at the Zambia Library Association Seminar on the Need for a development - oriented National Information Policy in Zambia within the context of the Southern African Documentation and Information System (SADIS), held in Lusaka, Zambia, 9-13 Sept., 1985. (Mimeographed). p. 12.2.

36. MABBS, A.W. The National Archives of Ethiopia. (Participation in the activities of Member States in the field of Information) Paris UNESCO, 1982. 45p. (PP/1981-1983/5/10.1/05).

37. MABOMBA, R.S. Information resources available in Malawi: A sector-by-sector analysis. *In* Seminar on National Policy on Library and Information Services, March 4-6 1987. Report Edited by Steve S.Mwiyeriwa. Lilongwe. pp.27-43.

38. MABOMBA, R.S. Towards a national documentation and information service in Malawi: a background to local activities and external influences. *MALA Bulletin*, 3(2), Aug. 1983. pp.1-8.

39. MALAWI. Laws. Chapter 19:01 (18 of 1947 20 of 1956). Printed Publications: An Act to make provision for the Registration of Newspapers, the Printing and Publication of Books and the Preservation of Printed works published in Malawi. [1968]. 4p. (L.R.O.1/1968). (Includes Subsidiary Legislation: Printed Publication Rules).

40. MANAGEMENT of a National Information and Documentation Network in Zambia: Report of Workshop held in Lusaka, Zambia, 15-24 February 1988. Organized by Zambia Library Association (ZLA) in co-operation with Zambia National Library Service, University of Zambia Library, National Council for Scientific Research and the German Foundation for International Development. Bonn/Lusaka: DSE and ZLA, May 1988. 171p.

41. MANPOWER Training Needs: Proceedings and Papers of the Information Experts meeting, Harare, Zimbabwe, 18-21 March. 159p.

42. MAZIKANA, P.C. A national information service: Zimbabwe's position. In Establishment of a national information service in Botswana: Report of a Workshop held in Gaborone/Botswana, from 23 to 27 February, 1987. Lutz Huttemann (ed.) ... Bonn/Gaborone. pp. 170-178.

43. MCHOMBU, K.J.Development of Library and Documentation Services in Tanzania: Problems of strategy and tactics. Information Processing Management, Vol. 20, No. 4, 559-569. 1984.

44. MENGSTEAB, Adhana. National information policy, manpower training needs and teaching materials: the Ethiopia scene. In: Manpower Training Needs: Proceedings and papers of the Information Experts Meeting, 18-21 March, 1985, Harare/Zimbabwe. Edited by Lutz Huttemann. Boon: DSE, 1985. pp. 29-34.

45. MENOU, M.J. Project for the Establishment of a National Agricultural System (Tanzania): Report of a Consultancy Mission. Rome, FAO, 1975. (FAO,URT/71/527).

46. MONTVILOFF, Victor. Opening Remarks. Seminar on National Information Services, Lilongwe, Malawi, March, 4-6, 1987. Report, edited by Steve S. Mwiyeriwa. Lilongwe, [Malawi National Library Service], 1987. p.12.

47. MOSHESHOE, M.M. The fitting of national information services into regional systems and the use of such services and systems. In Co-ordination and Improvement of National Information Services: Mbabane and Maseru Workshop papers: Report of two Workshops held in Mbabane/Swaziland from 24-27 February 1986 ... and in Maseru/Lesotho from 3-7 March 1986... Edited by Lutz Huttemann. Bonn, DSE, 1986. pp. 180-198.

48. MUSISI, J.S. Kenya. In International Handbook of Contemporary Development in Librarianship. Edited by Miles M.Jackson. Westport, Conn., USA, Greenwood Press, 1981. pp. 27-39.

49. NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY, Kenya, National Scientific Information Policy. Prepared by NCST Committee on Documentation and Information for consideration by NCST Steering Committee. Nairobi, NCST, 1987, 34p.

50. NATIONAL Information Policy in African countries UNISIST Newsletter, vol. 15, No. 2, 1987. pp. 25-26.

51. NATIONAL Seminar on the Role of Library and Information Services in the Rebuilding of Uganda, Makerere University, East Africa School of Librarianship, 21-24 September 1987.

52. NEILL, J.R. Library Manpower Planning in Southern, Central and Eastern Africa. In: Manpower Training Needs: Proceedings and papers of the Information Experts Meeting, 18-21 March 1985, Harare, Zimbabwe. Edited by Lutz Huttemann. Bonn, DSE, 1985. pp. 19-28.

53. NHLAPO, M.M. The place of a documentation centre in the supply of information in Swaziland: Problems and prospects. In: Co-ordination and improvement of national information services: Mbabane/Swaziland from 24-27 February 1986 ... and in Maseru/Lesotho, 3-7 March 1986. Edited by Lutz Huttemann. Bonn, DSE, 1986. pp. 21-35.

54. NHLAPO, M.M. Establishment and Management of a national information service - Swaziland country report. In: Establishment and Management of a National Information Service in Botswana. Report of a Workshop held in Gaborone/Botswana, 23-27 February 1987. Organized by the Botswana National Library Service (BNLS) and [the] German Foundation for International Development (DSE) in co-operation with the University of Botswana, Department of Library Studies and [the] University Library. Bonn/Gaborone, DSE/BNLS, 1987. pp. 179-184.

55. OCHALA, F.W. The Kenya National Bibliography. International Cataloguing, vol. 13, No. 3, July/September 1984.

56. OLIER, Jacques, H.d' and DELMAS, B. Planning national infrastructures for documentation, libraries and archives: Outline of a general policy. Paris. The UNESCO Press, 1975, p. 328.

57. ORGANIZATION OF AFRICAN UNITY. The Lagos Plan of Action. Addis Ababa: 1980, 132 p.

58. OTIKE, J.N. A proposal for the establishment of a formalized co-operative programme for special libraries in Kenya. pp. 103-112. [1985?]. [Main document, of which this paper is a part, unknown]

59. PARTHASARATHY, S. Report on the Establishment of a National Scientific and Technological Information Centre and a National Scientific and Technological Information System in Ethiopia. Preliminary Draft. Addis Ababa, 1978. 75p.

60. POSNETT, N.W. Library and Information Advisory Visit to Kenya Agricultural Institute (KARI) in Nairobi, Kenya, 6-20 June 1986. Surbiton, Survey [United Kingdom], Land Resources Development Centre, 1987.

61. The PROPOSED Establishment of National Information system (NATIS) and National Information Policy Guidelines for Uganda to be presented to Cabinet [by the] Ministry of Public Service and Cabinet Affairs and Uganda National Commission for UNESCO. 1987.

62. QOBOSE, Edwin E. Library co-operation in Botswana: a critique. [1985?] pp 23-39. [Original document, of which this is a part, unknown].

63. A REPORT on Co-ordinating Information Services in Botswana.Prepared by the Drafting Committee. Gaborone, Information and Documentation Committee, 1988. 56p.

64. ROGGEMAN, J. Mission to Zimbabwe, 25 October - 20 November 1982: Report [of a Mission to study the Feasibility of Establishing an Agricultural Documentation Centre (ADC/ZW). Mission carried out within the framework of the United Nations Interim Fund for Science and Technology for Development. Rome, FAO, 1982. 5, [3], 11p. (Project UNO/INT/002/STD-INT/81/T01/A/71/12).

65. ROSENBERG, Victor (1982). National Information Policies.*Annual Review of Information Science and Technology*, vol. 17(1), 1982. pp 1-32.

66. SAMAHA, E.A. Study on the Application of Scientific and Technological Information in Development - Field study in Tanzania. Prepared for UNESCO Paris, UNESCO, 1978 [iii] p. 77, 6, [7] (PG1/78/WS/6.)

67. SCHWARTZ, S. and WINKEL, A. Support for a National Research Information Service in Tanzania: (Report from a visit to Dar-es-Salaam, 16-19 April, 1984). Stockholm: The Royal Institute of Technology Library; 1984. (Stockholm Papers in Library and Information Science, Report TRITA - LIB - 1126). [Sponsored by NNSRC, Dar-es-Salaam: SAREC, Stockholm and the Danish UNESCO Commission, Copenhagen]. 15p.

68. SEETHARAMAN, M.N. Planning the Establishment of a National Scientific and Technological Information and Documentation Centre [for Ethiopia]. Bangalore, India, 1987.

69. SEMINAR ON National Policy on Library and Information Services, Lilongwe, Malawi, 4-6 March 1987. Report. Edited by Steve S. Mwiyeriwa. Lilongwe, [National Library Service, Malawi], 1987. 70p.

70. SLAMECKA, Vladimir. Information for Problem Solving in Socio-economic Development: Main issues discussed at the 4th UNISIST meeting on the Planning and Implementation of National Information Activities in Science and Technology, 5-9 May 1980; Reston, Va., USA, Paris, UNESCO, 1980. (PGI-80/WS/26).

71. SLAMECKA, Vladimir. Implications of Modern Information for National Information Policy and Planning, Main Issues Discussed at the 3rd UNISIST Meeting on the Planning and Implementation of National Information Activities in Science and Technology, 23-26 January 1979, Warsaw, Poland. Paris, UNESCO, 1979 (PGI/UNISIST II/Ref.1: PGI-79/Conf. 201/Col.8).

72. SWAZILAND. Laws: The Copyright (Amendment) Order, 1978 (King's Order-in-Council No. 3 of 1978). A King's Order-in-Council to insert a new Section 26 Bis in the Copyright Act No. 36 of 1912. (Date of Commencement: 14 April, 1978). Enacted by the King in collaboration with the Council. [1978]. pp 77-78.

73. SWAZILAND. Laws: The National Library Service Bill, 1984. Memorandum in terms of the Standing Orders of Parliament to be presented to the Minister for Education. Memorandum in Terms of the Standing Orders of Parliament. Government of Swaziland. 8p. [Includes Deposit Law and Repeal Copyright (Amendment) Order 1978].

74. TANZANIA. Ministry of National Education: National Policy on Library Development (Draft). (Translated from Kiswahili). Dar es-Salaam, Ministry of National Education, 1983. 34 p.

75. TEFERI, Kebede, Scientific and technological information services in Ethiopia: A paper presented for the first National Conference on Science and Technology Policy for Ethiopia. Addis Ababa, 20-25 June 1988. 23 p.

76. TIKU, K. The realities of STI System in Ethiopia. *In*: The Role of Scientific and Technological Information in Development: Proceedings of the International Seminar on the Vienna Programme of Action, Role of Information in Accelerating Scientific and Technological Progress in Developing Countries and Prospects for the Establishment of a Global Information System held at Moscow, USSR, 24 Sept. - 5 October 1985. Moscow, VINITI, 1985, pp. 87-95.

77. UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION. NATIS

- National Information Systems: Objectives for National and International Action. Paris, UNESCO, 1974.
- The Intergovernmental Conference on the Planning of National Documentation, Library and Archive Infrastructures: Final Report. Paris, UNESCO, 1974. 65p.
- Inter-governmental Council for the General Information Programme. Sixth Session, 17-21 November, 1986. Final Report. Paris, UNESCO, (PG1-86/Council VI/7).
- Report of the Director-General, 1979-1980. [Paris, UNESCO, 1981].
- Report of the Director-General, 1981-1983 [Paris, UNESCO, 1984].

78. UTA, J.J. National Information Policies in the Eastern and Southern Africa region. *In*: Manpower Training Needs: Proceedings of the Information Experts Meeting, Harare/Zimbabwe, 18-21 March 1985. Harare/Bonn, DSE, 1985.pp. 11-18.

79. VAGIANOS, Louis; Information in the Economy: The Third World Perspective. *Bulletin of the American Society for Information Science*, Feb/March 1988. pp.23-25.

80. WALFORD, John. Review of the Kenyan National Archives: Report prepared for the Government of the Republic of Kenya by UNESCO. Paris: UNESCO, 1982, (Technical Report PP/1981-1983/5/10-1/105; FMR/PG1/82/47).

81. WALUBITA, M. The Role of Zambia Library Service in the supply of information in Zambia. In: Management of a national information and documentation network in Zambia: Report of a Workshop held in Lusaka/Zambia from 15 to 24 February 1988. Bonn/Lusaka, DSE and ZLA, 1988. pp. 73-85.

82. WESLEY-TANASAKOVIC, Ines. Guidelines on national information: policy, scope, formulation and implementation prepared by Mrs. I.Wesley-Tanaskovic [for the] General Information Programme and UNISIST. Paris: UNESCO, 1985. XIII, 40p. (PGI-85/WS/14).

83. WILLIAMS, Robert, V. The Role of Inter-Governmental Organizations international information transfer and policy. Special Libraries. Winter, 1988, pp. 1-8.

84. WINKEL, Annette and SCHWARTZ, S.A. model for Scientific and Technological Information provision to small research and development systems in developing countries, with case studies in Ethiopia and Tanzania. Stockholm, the Royal Institute of Technology Library, August 1984. 13p. (Report TRITA LIB - 1134).

85. WOOD, Kate. Education and training in Uganda: Report on an investigative visit, 1-12 December 1986.

86. ZAMBIA LIBRARY ASSOCIATION (ZLA). National Information Policy for Zambia: Draft Proposal [by the ZLA Working Party on National Information Policy. Lusaka, ZLA, 1987]. VIII, p. 28, 2.

J. ACRONYMS USED IN THE REVIEW

AGRIS	-	International Information System for the Agricultural Sciences and Technology (Food and Agriculture Organization)
BNLS	-	Botswana National Library Service
CSIR	-	Council for Scientific and Industrial Research (Ghana)
DEVSIS	-	Development Sciences Information System
DSE	-	Deutsche Stiftung fur Internationale Entwicklung (German Foundation for International Development)
ECA	-	Economic Community for Africa (United Nations)
ECOWAS	-	Economic Commission for West African States
ESADIS	-	Eastern and Southern African Documentation and Information System (proposed)
ESAMI	-	Eastern and Southern African Management Institute (Based in Tanzania)
ESTC	-	Ethiopia Science and Technology Commission
EURONET	-	European On-line Information Network (European Economic Community)
FAO	-	Food and Agriculture Organization of the United Nations
IDDA	-	Industrial Development Decade for Africa
IDDC	-	Information and Documentation Co-ordinating Committee (Botswana)
IDRC - IS Division	-	International Development Research Centre, Information Sciences Division
IGOs	-	Intergovernmental Organizations
INFOTERRA	-	International Referral System for Sources of Environmental Information (United Nations Environmental Programme) Formerly UNEP/IRS

INIS - International Nuclear Information System (International Atomic Energy Agency)

INTIB - Industrial and Technological Information Bank (United nations Industrial Development Programme

KLS - Kenya Library Service

NATIS - National Information System

NCST - National Council for Science and Technology (Kenya)

NIAAC - National Information Agency Advisory Committee (Uganda)

NLDS - National Library and Documentation Service (Zimbabwe)

NSTIDC - National Scientific and Technological Information and Documentation Centre (Ethiopia)

OAU - Organization of African Unity

PADIS - Pan African Documentation and Information System

PANA - Pan African News Agency

PGI - General Information Programme (UNESCO)

SADIS - Southern African Documentation and Information System (Defunct)

SAREC - Swedish Agency for Research Co-operation with Developing Countries

TLS - Tanzania Library Service

UAP - Universal Availability of Publication (International Federation of Library Associations and Institutions)

UBC - Universal Bibliographic Control (International Federation of Library Association and Institutions)

UNCSTD - United Nations Conference for Science and Technology for Development.

UNDP - United Nations Development Programme

UNESCO - United Nations Educational, Scientific and Cultural Organization

UNIDO - United Nations Industrial Development Organization

UNISIST - Intergovernmental Programme for Co-operation in the field of Science and Technological Information

UNPAAERD - United Nations Programme of Action for Africa's Economic Recovery and Development

USNAS - United States National Academy of Sciences

ZACLIR - Zambia Advisory Council on Library and Information Resources (the proposed co-ordinating Agency in the Draft Information Policy Proposals for Zambia)

ZLA - Zambia Library Association

ZLS - Zambia Library Services

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION III.2

LITERATURE REVIEW

NATIONAL INFORMATICS POLICIES IN SUB-SAHARAN AFRICA

E. Zwangobani
NCR Zimbabwe

CONTENTS

A. INTRODUCTION

B. METHODOLOGY

C. LEVELS OF COMPUTERIZATION

D. THE ROLE AND SCOPE OF A NATIONAL INFORMATICS POLICY

E. NATIONAL ISSUES

- a) Centralization versus decentralization of information systems
- b) Information systems planning, co-ordination and control
- c) National employment policy
- d) Access to data/information
- e) Education and training

F. THE SITUATION IN THE TARGET COUNTRIES

- i. Botswana
- ii. Kenya
- iii. Lesotho
- iv. Malawi
- v. Mauritius
- vii. Mozambique
- viii. Swaziland
- ix. Tanzania
- x. Zambia
- xi. Zimbabwe

G. COMPARATIVE ANALYSIS BASED ON POLICY ISSUES BY COUNTRY

- a) Informatics goals and priorities
- b) Institutional and technical basis
- c) Centralization and decentralization
- d) Hardware / software acquisition
- e) Education and training

H. CONCLUSION

I. REFERENCES

Annex 1: Notes for the guidance of firms or organizations wishing to apply for an allocation of foreign exchange with which to acquire and import a computer system of a value greater than Z$15,000 f.o.b.

Annex 2: Data Preparation and Processing Equipment (Kenya).

A. INTRODUCTION

This paper was based on a survey of published and unpublished literature on informatics policies in selected sub-Saharan countries of Africa. The rational behind the project was the assumption that literature existed on informatics policy issues, that there were policies to be documented and that if not, then there should at least be some material on specific informatics issues at policy levels. Searches revealed a considerable body of literature on the application aspects of informatics. Disappointingly, however, very little has been written about policies or policy issues, in spite of the eagerness with which informatics has been embraced as a tool for management.

The term "policy" may be defined as "basic principles or assumptions on which a programme of action is based" [UNISIST, 1985], but it may also refer to a general plan of action, plans and strategies. In this report the term national policy is used to mean an integrated national policy, while sectoral plans and strategies are referred to as policies qualified by the sector or policy issues. Almost all the countries studied have policies dealing with one or more informatics problem related to sectoral issues. The terms informatics and information technology are used interchangeably.

Recent developments in computer and telecommunication technologies have given significant impetus to the demand for and provision of more and better information support in various public and private sectors. The recognition that information processing is essential for more cost effective management is widespread. As a result, informatics is beginning to change government and company operations in a number of African countries. It is a powerful agent for technological and social change.

There is some concern, however, that most African countries have yet to demonstrate a sound ability to harness this new technology effectively for development, possibly because of the lack of a clear conception of ways of integrating it into the national development process.

B. METHODOLOGY

In order to obtain data on the literature available, a few selected countries (Kenya, Tanzania, Zambia, Zimbabwe and Botswana), were visited for discussions with key informatics personnel in Government central computer centres and other leading data processing organizations. They were requested to provide copies or references to relevant literature. Data processing and library staff in the Universities were similarly interviewed, for in some countries e.g. Tanzania, the university play a leading role in attempts to persuade the Government to formulate an informatics policy.

Literature searches were attempted in the University of Zimbabwe library and in the National Archives of Zimbabwe, but these were not fruitful. Time did not allow wider searches or discussions.

In addition to the scarcity of material, where Government documents exist there is often the additional problem of security, so that relevant material is not available to the public or to researchers.

C. LEVELS OF COMPUTERIZATION

Advances in informatics are both an opportunity and a threat to developing countries. The threat is two-fold. First, the rapid development of informatics in the industrialized countries renders the developing countries less able to compete in the international market place. Secondly, informatics is a force for major social change. Both these processes need to be monitored and controlled. On the other hand, LAWLESS and PASSMAN [1985] state that the technological developments of informatics represents the first significant technological advance which a developing country can exploit to suit their own interests with relatively low capital investment and without extensive prior involvement in the related prior technologies.

The stage of development of informatics in the countries of Eastern and Southern Africa is similar. The United Nations [1971] has categorized four stages of development of computer technology in developing countries; initial, basic, operational and advanced. Table I below [NARASHIMHAN and RAO, 1984] summarizes the characteristics which define these levels.

In most African countries the use of computer technology falls somewhere between the basic and the operational. Computerized information systems are thought of in terms of "bread and butter" with such applications as payroll and stock control.

TABLE I: LEVELS OF COMPUTERIZATION

Level	Characteristic
Initial	No operational computers in the country. A few people only have had contact with computing. The only local sources are computer salesmen.
Basic	Some understanding of computers in Government and private sector decision centres and a few computer installations are to be found. Some nationals involved in computer operations and some education and training in computer technology in the country. Computers are used in basic Government operations.

Operational	Extensive understanding of computers in Government and private sector decision centres. There are centres for education and training in computer technology and some are of excellent and some are of excellent quality, offering degree programmes in computer or information science. Local production of software and some hardware. Computers affect many disciplines, particularly science, engineering and medicine.
Advanced	Most Government administrative work is carried out by computers. There are well-established professional activities and national meetings on computers and a complete range of quality education and training programmes. The number of computers, of all sizes, is increasing rapidly. Time-sharing, teleprocessing, and remote job entry are common. There is design and production of both hardware and software. New applications of computers are found regularly. There is strong participation in and contribution to international activities.

NARASHIMHAN [1986] makes the point that "in most developing countries first introduction to computers and computing has been from the outside, mostly through the marketing initiatives of multinationals from the west. The first applications are invariably in commercial data processing (i.e. payroll, accounting, invoicing, etc). These graduate into management information applications, such as, planning, project-control, modelling, simulation etc."

It is clear that while African countries have made relatively heavy investments into computer and related technologies there is a dearth of underlying computer technology which hardly rises above the basic level.

The effective application of informatics, therefore, has hardly begun. But since the uncontrolled introduction of informatics can be as harmful as the absence of this technology, it is important for nations to analyze critically their current status in informatics, in terms of national objectives, the resources required and costs.

D. THE ROLE AND SCOPE OF A NATIONAL INFORMATICS POLICY

National policy can play a vital role in the development of informatics by motivating and guiding formative activities. Supporting legislation can be used to implement the policy through programmes, regulations, and the establishment of institutions to advise and support the development of informatics. The overall objective of policy actions is to enhance the effectiveness of informatics at minimal economic and social cost. Recognizing the importance of informatics policy the Southern African Regional Workshop on Informatics for Development produced a series of recommendations which were subsequently transmitted to the governments in the region.

A national informatics policy should identify the requirements, make provision for necessary resources and promote the effective use of informatics for the betterment of society. Experience has shown that a national policy on informatics is a major determinant in developing and improving informatics. In general such a policy should address the following issues [UNITED NATIONS, 1984].

A national informatics policy should define the informatics requirements which are supportive of national development goals. Since it is not possible to meet all the requirements at once priorities should emerge from the national planning process and be determined by the government. Priority areas should be allocated adequate resources to ensure success. This process normally leads to the sectoral development of informatics which requires co-ordination to avoid duplication.

An institutional framework must be established to define policy issues and co-ordinate policy implementation. Both policy formulation and review are best carried out by an inter-ministerial body, which in order to make it representative should include representation from private professional bodies for example, the legal profession, electronic and electrical engineers, and national computer organization(s). It should be headed by a top-ranking Government official, in order to stress its importance and strengthen its negotiating position with other ministries.

This body has three important functions:

(a) the development, implementation and review of informatics policy,

(b) the co-ordination and management of government information technology and systems;

(c) the provision of informatics technical advice and support service.

This policy body requires both adequate staff and resources to carry out its duties which include developing guidelines for the development and management of information systems, reviewing information systems plans and proposals and controlling government spending on informatics projects.

E. NATIONAL ISSUES

In formulating an integrated national informatics policy, many national issues must be considered. The importance of these issues depends on the level of development of informatics in the country. For example the manufacture of computers may be important in one country, but a non-issue to another. The list below is not comprehensive, but simply a guide.

a) Centralization versus decentralization of information systems

The arguments for and against the centralization of information systems are well-known and need no repetition. It is felt developments in both hardware and software make the distributed system the ideal combination. Systems that require sharing can be centralized through a central computer site. In order to derive maximum benefit from the micro-computer revolution, government policies are required to set minimum standards and enforce compatibility.

Policies and programmes are also required to encourage the sharing of information technology among different users and avoid the problems of non-compatible equipment. The development of standards for information systems software, hardware, and development procedures is another way of promoting sharing among departments and agencies.

b) Information systems planning, co-ordination and control

A national policy can support effective management practices by requiring government agencies to submit regular information system plans, by giving the central agency responsibility for co-ordinating activities between government agencies and by establishing procedures to control the acquisition of hardware and software. Planning is essential to avoid the haphazard development of informatics. The technology acquired should reflect priorities in the development plans, not the whim of some official.

c) National employment policy

In many instances the first applications to be computerized are those which are labour intensive, because increases in the volume of data to be handled can quickly become unmanageable for existing staff. Furthermore, the costs of computerization can more easily be justified where outlay on staff salaries is reduced. In such a case, programmes for job creation should accompany plans for informatics development. Innovative approaches may be required to attract and retain staff in government service where salaries are not competitive with private sector employment.

d) Access to data/information

Regulations governing information systems design, personnel, operation and data transmission are required to address security issues. Legislation or regulations to ensure the privacy of data normally require that the "collection, maintenance, and dissemination of information by the government be consistent with the laws relating to confidentiality". Much of the data collected by government is of interest to other outside organizations and individuals. Thus, legislation or regulations are required to define public access.

e) Education and Training

National policy should support the establishment of competent educational programmes in informatics both in the public and private sectors. Regulations are required to protect members of the public from exploitation by incompetent and inappropriate training institutions.

F. THE SITUATION IN THE TARGET COUNTRIES

Although few of the countries surveyed have integrated national informatics policies in place, an awareness of the need for such policies is felt in all of them. As a result all are at varying levels of advancement towards the formulation of some sort of integrated national policy, often including clauses and policies on the acquisition of hardware.

Discussions with some of the officials involved in endeavours to formulate policy, however, revealed a lack of confidence in the capability of their countries to implement successfully a formulated policy.

The progress of each selected country in formulating national informatics policies will be examined in alphabetical order. Regulations related to computer acquisitions from Zimbabwe and Kenya re included as examples in Annexes 1 and 2.

i. Botswana

Botswana does not have a national informatics policy. The Government has, however, a high-powered Computer Steering Committee chaired by the Administrative Secretary, Ministry of Finance and including the Director of Financial Affairs and the Director of the Government Computer Bureau. The Computer Steering Committee is the policy arm, while the Government Computer Bureau provides technical expertise and implements Committee decisions.

The Computer Steering Committee deals with all issues pertaining to computer acquisition and related matters such as training. It does not, however, deal with telecommunications as such except in so far as they relate to computer networks.

The approach is interesting from two points of view. First, the local currency, the Pula, is convertible, which means that Botswana does not suffer the foreign currency restrictions faced by many other African countries. Secondly, this committee does not receive its mandate from Government policy as such, rather it results from the initiative of the Ministry of Finance. Other countries have tried to develop an informatics policy as part of current government policy and have not got quite as far.

ii. Kenya

In Kenya an inter-ministerial, interdisciplinary committee was created including both information systems and informatics specialists to work on the country papers for the Addis Ababa Conference. The terms of reference of this Committee included the area of information technology policy. The Kenya paper highlights the developments that have taken place as a result of this move. The co-ordinating authority for informatics is the Department of Computer Services under the Ministry of Finance.

iii. Lesotho

Lesotho has neither a national informatics policy, nor a central co-ordinating authority [PHAMOTSE, 1986]. There are plans to establish a Central Informatics Authority consisting of high ranking officers in Government.

iv. Malawi

Malawi has no national informatics authority as such [CHILAMBE, 1986]. The Government Computer Centre is probably the most suitable body to be assigned this role. The Data Processing Department is charged with responsibilities which include [CHILAMBE, 1987]:

(a) the recruitment and development of government computer personnel;

(b) data processing services to ministries and departments

(c) advisory services to the Government Computer Committee.

The activities of the Government Computer Committee are presently confined to acquisition of hardware and/or software, although its responsibilities are expected to expand to include the production of policy recommendations.

v. Mauritius

Mauritius is the only country survey which has made considerable progress towards a national Informatics policy. The government attitude to informatics can be seen in the reduction of customs duty on hardware and software [WONG KO WANG, 1987]. In his Budget Speech for 1984-85 the Minister of Finance said "Mauritius cannot afford to lag behind in the field of modern technology. I am aware of the heavy investment required for the development of such technology. In order to encourage the increased use of computers, I am reducing duty on the imports of computers and components."

The Minister returned to this theme in his 1985-86 Budget speech when he decided to reduce the duty to a nominal rate of 10-5-0 as a further incentive. The Government is taking steps to introduce computer studies in the school curriculum".

In the 1986/87 Budget duty on computer software, electronic games and pocket calculators was reduced from 50-30-0 to 5-0-0.

The 1985/86 Budget also launched the Public Sector Management Improvement Programme, a scheme to review, upgrade and streamline management practices within the public service. The establishment of a Steering Committee with three working groups was proposed on:

(a) Human resources management;

(b) Financial management;

(c) Project and assets management.

The Financial Management Working Group was given the task or formulating a computerization programme for the public sector, which is already in progress.

Furthermore the Ministry of Economic Planning and Development, proposed to publish a national informatics plan. The topics to be covered include the introduction of information technology in agriculture, administration and industry; the training needs and the legal aspects of informatics etc.

vi. Mozambique

The Government of Mozambique set up a Special Commission on Informatics [CUMBANE, 1986], composed of five government servants, four of whom are ministers to prepare the 1980 census. The Commission defined several measures to be taken in the main frame computer area as well as the policy to be adopted for the 1980 census. It is not known whether this Commission is still operating.

vii. Swaziland

Swaziland has no informatics co-ordinating authority [KUNENE, 1986]. Plans were being formulated in 1986 to establish a committee of computer professionals and policy-makers to look into policy issues relating to informatics.

viii. Tanzania

Tanzania has an interesting informatics policy. In 1974 the Government took the unusual step of banning importation of computers and television sets [Tanzania Government Gazette, Notice No. 142, 1974]. This came about because policy-makers felt that the installed computers were under-utilized [YONAZI, 1986]. Having survived this crisis, Tanzania is beginning anew from a policy perspective. This dates from the high-level seminar held in Arusha in August 1987, on the Contribution of Informatics to Economic Development [KODA, 1987]. It made 21 observations on the development of informatics in Tanzania and produced 6 recommendations for Government.

The first recommendation was for the formation of a task force charged with examining the complexities and recommending policies and strategies. As a result of the recommendations, in December 1987, the Government formed a task force "from various institutions to study and recommend to Government actions required to ensure an appropriate progress in informatics development in Tanzania" [RUTIHINDA, 1987]. The Committee, chaired by the Commission for National Economic Policy and Planning, has members from the University of Dar-Es-Salaam, the Commission for Science and Technology, the Government Computer Centre, Post and Telecommunications and the Ministries of Education and Agriculture. It was given three months in which to complete its task but to date this has not been achieved. Members of the Committee estimated that policy recommendations should be produced before the end of this year.

ix. Zambia

Zambia has made some definite strides towards producing policy recommendations in library and information science, but there have been no similar moves in informatics. The central informatics authority is the Data Processing Unit which is a department of the Ministry of Finance. Rules and procedures, however, do exist for the acquisition of hardware. These will be considered.

x. Zimbabwe

Zimbabwe also has no national policy on informatics although it has regulations and procedures for the acquisition of hardware. The central informatics authority is the Department of Central Computing Services in the Ministry of Finance. A number of papers recommending policy actions have been produced. In 1985 the Scientific Computing Centre wrote a paper [ZWANGOBANI, 1985] recommending policy options in informatics notably an inter-ministerial committee. This paper was discussed in the Ministry of Finance but the committee has yet to be established.

G. COMPARATIVE ANALYSIS BASED ON POLICY ISSUES BY COUNTRY

In the following sections the approaches taken by the countries on policy issues will be compared with a view to detecting any common trends. This analysis should help to deduce the direction being taken by informatics, in policy priorities in Africa.

In this comparative analysis it should be borne in mind that the literature reviewed may refer to different time frames. Some of the documents were written in 1986 and a good deal may have changed in the countries concerned since then.

a) Informatics Goals and Priorities

Of the countries surveyed Mauritius seems the only one with documented informatics goals and priorities. In a paper presented at the Victoria Falls Conference, CHAN KONG [1986] lists the priority areas. Sugar and tourism as the leading foreign exchange earners, head the list. Mauritius establishes a definite link between informatics and education curricula,but there is no information available on the success of introducing computer courses in education. In Tanzania about 18% of the installed computer base is in agriculture [NDAMAGI, 1987], followed by communications and transport at 16% and then baking, 14%. NDAMAGI [1987] lists the most common applications:

i. General management information systems
ii. Planning and development models
iii. General office automation

In the absence of an informatics policy it is safe to assume that these applications reflect definite needs and national priorities.

Priority areas are sometimes established by default in the absence of policy. Governments generally have priority areas for development which tend to be favoured in the allocation of resources, such as foreign currency. Zimbabwe is such an example, where applications for foreign currency allocation to import computers tend to get favourable treatment if they are destined for priority sectors. An application for foreign currency from a supermarket is less likely to succeed than one from a fertilizer factory. The result of this default prioritization is a tilt in favour of the priority areas in informatics sectoral development.

b) Institutional and Technical Basis

The majority of countries surveyed tend to go about producing policy recommendations by setting-up inter-ministerial committees for this purpose. These are often dominated by non-informatics people. Further, the tendency to use the main informatics authority (e.g. Government Computer Centres) as both the main policy implementing body and as a resources centre is quite evident. Thus, the DP manager of the Government Computer establishment is in a pivotal position, able not only to influence policy formulation and its implementation, but also to catalyze the process of policy formulation. It follows, therefore, that the experience, training and drive of this individual can have an important bearing on the pace of events in informatics in the public sector and perhaps in the country as a whole.

An important point to notice in regard to the inter-ministerial committee is that almost all of them seem to have an ephemeral existence. The high staff turnover in government does not explain this phenomenon. In Kenya, Tanzania and possibly in Zambia, these committees were established, met for some time and then withered away. A possible explanation may be that they do not fulfil any function that would be disadvantaged in their absence. Consequently nobody mourns their passing. This may be another indication of the lack of commitment to information technology on the part of non-IT officials. Equally it may be an indication of a lack of commitment to the purposes for which the Committees are created, for any government committed to a set of goals would surely set up viable machinery to achieve and maintain them.

c) Centralization and Decentralization

Almost all countries surveyed have a centralized data processing department in the Ministries of Finance, which is usually in charge of policy implementation and where hardware, software and manpower resources are concentrated. Mauritius is an exception for it decided [KO NANG, 1987] to allow other ministries and departments to set up DP sections. The main DP department in the Ministry of Finance offers technical assistance and advice but does not exercise control.

There are various possible combinations of centralization and decentralization from both policy and practical standpoints:

Centralized Resources with a Centralized Policy
Centralized Resources with a Decentralized Policy
Decentralized Resources with a Centralized Policy
Decentralized Resources with a Decentralized Policy

The first two strategies are common in the countries surveyed. Taken to the extreme, decentralized policy formulation and/or implementation means that various organs of government adopt strategies which relate to informatics independently of each other, with no visible co-ordination.

From a policy standpoint, it may be questioned whether a poorly functioning central DP department is not part of the problem. It would perhaps be more efficient if decision-making and authority were more decentralized and the central DP organization were used as a resource centre. With today's technology, the third and fourth centralization/decentralization models shown above could perhaps produce better results for African countries.

d) Hardware/Software Acquisition

The functions of the central DP department often include monitoring/controlling the acquisition of hardware and software by other ministries and departments. Again the approaches by the different countries are very similar.

In Botswana the Government Computer Bureau evaluates the procurement plans of all government ministries and departments, and of a few parastatals, chooses a supplier and presents its recommendations to the Central Tender Board. The Central Tender Board will only approve applications if the Government Computer Bureau has given its written approval.

At the beginning of every 5 year planning cycle ministry informatics proposals are submitted to Ministry of Finance and if accepted they will be included in the plan. The necessary funds are released if and when the Division of Economic Affairs and the Computer Committee are satisfied that the application is justified. Most parastatals do not come under this system, though some of them go through the Government Computer Bureau.

In Zimbabwe, all ministries and government departments must get clearance from Central Computing Services (CCS) before approaching the Treasury for funds to purchase a computer. This procedure applies to aid-funded projects as well. In practice it is frequently flouted, particularly for microcomputer acquisition.

The power of the CCS extends further. The Public Service Commission will not create a computer post in a ministry or department without clearing the proposals with the CCS. It is reluctant to create any computer post outside the CCS. The Department recommends appropriate job descriptions, salary levels and whether the post is justified. Acquisition of information technology by the private sector is controlled through the Ministry of Trade and Commerce, since companies wishing to import computers must apply for foreign currency allocations. In order to evaluate these applications competently the Ministry of Trade and Commerce established a Computer Allocations Committee, chaired by the Deputy Secretary in the Ministry and comprised of:

Ministry of Trade and Commerce
Ministry of Finance
Ministry of Industry and Technology
Central Computing Services.

The allocations are carried out in accordance with national development goals. The Computer Allocations Committee has the right to inspect an applicant's premises.

In Zambia, prior to the introduction of the Foreign Currency Auction System (October 1985), the procurement of hardware required the prior approval of the Computer Utilization Committee (CUC) [SHITIMA, 1987]. Now, applications for foreign currency are evaluated by the Foreign Exchange Allocations Committee (FEMAC). It is not clear whether a public sector organization that has a FEMAC allocation still has to go through the UTC. Parastatals go through the Central Supply and Tender Board, which seeks a professional assessment from the Data Processing Unit.

In Tanzania, the Data Processing Centre Manager now handles all applications. This function used to be carried out by a committee but which no longer meets. The Treasury Instruction requires that all applications provide the following information [Tanzania Government Notice, 1974]:

i. Specification of type, make, capacity, configuration and costs;

ii. Detailed description of the task to be computerized;

iii. Why the tasks cannot be computerized using existing computer;

iv. Basis for choosing the particular equipment alternatives available;

v. The disadvantages of alternative approaches e.g. manual procedures.

Both Kenya and Malawi have central bodies that regulate the acquisition of computers. In Kenya the Government Computer Centre and in Malawi, the Central Computer Committee vets all applications for computer acquisition.

The overriding aim of controlling the acquisition of information technology seems to be foreign currency related, particularly when control is extended to the private sector acquisitions. Generally there is little attempt to control the actual computer models imported. If control is exercised it is through the availability of maintenance facilities in the country.

In telecommunications, however, definite model control is exercised, for example in Zimbabwe, where the approval for the device has to be obtained from the Posts and Telecommunications authorities. The telecommunications equipment has to meet certain performance standards.

There is no equivalent control evident in the acquisition and use of computers. The only standard usually defined is voltage and frequency. Individual organizations have standards relating to the connectability of their equipment.

e) Education and Training

In Zimbabwe computer education is available from high school to university level, following a government decision to introduce computers in schools. The constraint, however, is the scarcity of foreign currency to import the computers. There is, however, no link between the policy for schools and that for universities and polytechnics. The polytechnics offer various diploma courses for full-time and part-time study.

In the private sector, the Computer Society of Zimbabwe, with government blessing, produced a code of practice for training institutions offering computer courses. Training institutions abiding by this code have to register with the Computer Society. The accreditation is voluntary at this stage.

Kenya also has a diversified infrastructure offering computer education and training up to and including university level.

Zambia offers some facilities for training though much remains to be done. SHITIMA [1986] recommends to the Government that "adequate and urgent attention should be directed towards the establishment of a viable course in computer studies of international standard at the University (of Zambia) and one of the Polytechnic institutions".

NDAMAGI [1987] reports that training facilities in Tanzania are still very poor, perhaps due to the absence of an overall national policy on the development of information technology. The University of Dar-es-Salaam has offered computer appreciation and programming courses since 1969 and the same courses are still being offered. Recommendations by a 1974 ILO/NIP study team for a training strategy have yet to be implemented to the required level.

Some countries such as Botswana, have no computer training infrastructures at all. Throughout the region there is a paucity in quality training institutions and as a direct result, a scarcity of trained manpower.

No country has an overall policy on information technology education and training, but it could be argued that a country could have a coherent strategy for education and training in information technology without a policy framework. Many other disciplines have no such overall policy. The major difference, however, between education training in information technology and other disciplines is that information technology now permeates all professions. The fact that it has tremendous potential to increase the efficiency and effectiveness of all spheres of economic activity means that it deserves special attention. A policy framework is necessary, therefore, if the working population is to be able to cope effectively with an information age.

H. CONCLUSION

African countries have made a start in the area of informatics policy formulation and implementation and although none yet has a full national informatics policy, many have elements of policy covering priority areas of informatics.

It may well be questioned whether a full national informatics policy is a necessary condition for viable growth of informatics in a country, given the progress African countries to date have been made in the absence of such policies. There is ample evidence to suggest that aspects of policy can be formulated and implemented in priority areas without waiting for an integrated national policy. Examples include such areas as hardware/software acquisition, informatics in schools, computer manufacture/assembly and telecommunication standards. Some of these can then can be integrated in a national informatics policy at a later stage. The absence of a national informatics policy should not used to excuse lack of progress in the development of informatics.

Indeed the technology can develop so fast that there is little time to formulate policy, or even to investigate the social impact of a particular development. This does not mean that a national informatics policy is not necessary. Quite the contrary. Informatics technology has developed rapidly in many western countries without government intervention. In developing countries, however, public policy has a preponderant influence on economic development in general, so that a focused technological development such as informatics is best carried out within a national policy framework.

As a precondition to policy formulation it is important for governments to have accurate, up-to-date information on the local status of informatics and on the requirements in informatics in priority development areas.

I. REFERENCES

1. AFRICAN COUNCIL OF COMMUNICATION EDUCATION (Ghana Chapter), "New Communications Technologies", 1987.

2. CHAN KONG, C.Y.J., "Informatics Technology Status in Mauritius". Proceedings of the Southern African Workshop on Informatics for Development, Victoria Falls, Zimbabwe, May 1986.

3. CHILAMBE, P.E. "Information Technology in Malawi". Proceedings of the Southern African Regional Workshop on Informatics for Development, Victoria Falls, Zimbabwe, May 1986.

4. CHILAMBE, P.E. "Information Technology in Government of Malawi". Paper presented at the Eastern and Southern African Workshop on Information Technology in Government, Rusape, Zimbabwe, April 1987.

5. CUMBANE, S. "Status of Informatics in Mozambique". Proceedings of the Southern African Workshop on Informatics for Development, Victoria Falls, Zimbabwe, May 1986.

6. KODA, G.R., Bali, B.K.C., Bilal, M.C. and Sawe, D.A. (eds). Seminar on the Contribution of Informatics to Economic Development, Arusha, Tanzania, 1987.

7. KUNENE, P.E. "An Overview of Informatics in Swaziland". Proceedings of the Southern African Workshop on Informatics for Development, Victoria Falls, Zimbabwe, May 1986.

8. NARASHIMHAN, R., and Rao, P.V.S., "Computer Science and Technology in India: A Critical Assessment" Indian Academy of Science, Sadhana, Vol. 7, Part 3, November 1984, p. 203.

9. NDAMAGI, E. "Information Technology in Government: the Case of Tanzania". Paper presented at the Eastern and Southern African Workshop on Information Technology in Government, Rusape, Zimbabwe, April 1987.

10. PHAMOTSE, L.L. "The Status of Informatics Technology in Lesotho - Past, Present and Future". Proceedings of the Southern African Workshop on Informatics for Development, Victoria Falls, Zimbabwe, May 1986.

11. RUTIHINDA, G. Memorandum Re. No. MPEC/5/40/14 of 4/12/87 entitled "Appointment to the Tast Force for Informatics Development".

12. SHITIMA, M.N. "Information Technology in Government: the Zambian Experience". Paper presented at the Eastern and Southern African Workshop on Information Technology in Government, Rusape, Zimbabwe, 1987.

13. TANZANIA GOVERNMENT GAZETTE, "The Imports Control Ordinance, Government Gazette No. 24, Vol. IV, Dar es saalam, dated 14 June 1974.

14. TANZANIA GOVERNMENT NOTICE. "The Importation of EDP Equipment". No. 142, 14 June 1974.

15. UNISIST GUIDELINES ON NATIONAL INFORMATION POLICY, Paris, UNESCO, 1985.

16. UNITED NATIONS, The Application of Computer Technology for Development, 1971.

17. UNITED NATIONS Department of Technical Co-operation for Development (DTCD), Monograph on "Modern Management and Information Systems for Public Administration in Developing Countries", 1984.

18. WONG KO WANG, N. "Information Technology in Government: Mauritius". Paper presented at the Eastern and Southern African Workshop on Information Technology in Government, Rusape, Zimbabwe, April 1987.

19. YONAZI, E. "The Status of Computer Applications in Tanzania". Proceedings of a Regional Workshop on Fundamentals of Microprocessor-based Systems, Nairobi, Kenya, 1986.

20. ZWANGOBANI, E., Government Policy on the Acquisition of Data Processing Technology, 1985.

Annex I

NOTES FOR THE GUIDANCE OF FIRMS OR ORGANIZATIONS WISHING TO APPLY FOR AN ALLOCATION OF FOREIGN EXCHANGE WITH WHICH TO ACQUIRE AND IMPORT A COMPUTER SYSTEM OF A VALUE GREATER THAN Z$15000 F.O.B.

The Ministry of Trade and Commerce requires all applicants for foreign currency for the importation of computer technology to supply accurate and concise information based on the guidelines set out below. Applicants are warned than supplying the Minister with inaccurate or insufficient information would lead to delays in the processing of their application. Therefore all submissions to the Ministry of Trade and Commerce in the above regard should include information set out below.

1. APPLICATIONS FOR NEW COMPUTER INSTALLATIONS

PLEASE SUPPLY INFORMATION ON:

a) Company Structure: Is the company intending to purchase the computer a subsidiary of a local parent? If so, does the parent own or rent a computer? Alternatively, is the company a group. If so, does the group or any of its members own a computer? Details of installations owned by the local parent or other member(s) of a group are required.

b) Details of the computer configuration to be purchased, together with quotes from at least three independent suppliers, showing intended sale cost and actual f.o.b. value of system, (if the supplier considers the f.o.b value to be confidential this should be supplied direct to the Ministry)

c) An indication as to which computer system has been selected for purchase (not necessarily the lowest quote), and reason, (technical and otherwise), for this choice.

d) Details of applications to be computerised with an indication of the expected workloads on the selected computer.

e) Details of your firm's current work volume, broken down as follows:-

   i) Number of debtors, creditors general ledger accounts, stock control entries etc. and the average number of postings per month in respect of each;

ii) Number of employees paid monthly and the number paid weekly;

iii) Number of different organizations/users who will use the facilities of the computer system (include supporting documents).

f) How you intend to staff the installation;

g) Details of foreign exchange expenditure anticipated on ancillary equipment and technology such as air-conditioning, fire control, security systems, software packages, foreign expertise and spare parts.

h) Why it is not possible for your firm to utilise bureau facilities?

i) If it is the intention to have data-communication facilities to remote sites, indication of the support of the P.T.C. is required for the initial installation and subsequent maintenance of data communication lines.

j) Adequate evidence of capability by the supplier to maintain the installation in Zimbabwe (hardware and software).

k) A summarised cost-benefit analysis of computerization for company.

2. APPLICATION FOR UPGRADING OR EXPANDING EXISTING INSTALLATIONS

INFORMATION REQUIRED

a) Reasons for the upgrade? Relate the system specifications of the upgrade in terms of current and expected system performance and how this relates to the equipment and/or software needed for the upgrade.

b) Details of the upgrade configuration intended. The different components that need to be purchased should be described together with costs quoted by a named supplier for each.

c) Details of other alternatives considered.

d) The economic benefits of the upgrade

e) How the increased capacity and/or capability of the installation if expected to cope with the growth of the computer's workload for the next ten years.

3. APPLICATION FOR ESSENTIAL SPARES

PLEASE SUPPLY INFORMATION ON:

a) Reasons for needing the spares at this point in time.

b) The components required, their supplier and their cost. For which parts of the computer are these spares required?

c) The consequences if some of the spares are not available?

4. APPLICATION FOR CONSUMABLES

PLEASE SUPPLY INFORMATION REQUIRED

a) Provide details of the consumables required, their cost and sources of supply.

b) What is the rate of your firm's consumption per year for each category of consumables foreign currency is applied for? How often has your firm applied for consumables in the last financial year?

5. APPLICATION FOR SOFTWARE PACKAGES

INFORMATION REQUIRED

a) Provide names and concise description of the software packages required and the names of their vendors.

b) What is the intended use of the software package(s)? Give details and your assessment of alternative software available locally.

c) Who are your company's/organization's clients who will use that software? In what way are the intended applications in line with the priorities of the country.

Annex II

DATA PREPARATION AND PROCESSING EQUIPMENT (KENYA)

Further to Treasury Circulars No. 13 and 10 of 15th October 1973 and 17th September 1977 respectively and Treasury Circular letter HAS 3/020D of 4th November 1976, the following decisions have now been taken in respect of data preparation and processing facilities as provided within Government.

1. Data preparation facilities within Government will be reorganized under the overall charge of the Government Computer Centre, with subcentres being established at various points within the Government structure for convenient access by client ministries/departments.

2. The decision as to where particular sub-centres are to be located will take into account such factors as ease of access, workload, the need of sharing relatively expensive machinery, the availability of suitable accommodation etc.

3. Future procurement of data preparation equipment for installation under the above arrangements will be effected by the Government Computer Centre.

4. All equipment, personnel and supplies costs incurred in running these centres will be met by the Treasury.

5. All data processing services within Government will continue to be provided by the Government Computer Centre.

6. Any external aid agreements within which provision exists for the supply of data preparation and processing equipment and/or personnel must be cleared through the Government Computer Centre.

7. The rental costs of any data preparation and processing equipment currently installed will be transferred to the vote of the Government Computer Centre as from the 1979/80 fiscal year. In this context, any Accounting Officer within whose vote there exists provision for this type of equipment must convey the information to the Government Computing Centre not later than 31st December 1978.

The purpose of this Circular is to ensure that Government avails itself of the considerable technological advances taking place in this field in the most cost effective manner.

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION IV

SELECTED COUNTRY STUDIES

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

KENYA: NATIONAL INFORMATION AND INFORMATICS POLICY

M. Kariuki
Ministry of National Guidance and Political Affairs

E. K. Muthigani
National Council for Science and Technology

J.M. Ng'ang'a
Kenyatta University

S.K. Nguli
Ministry of Planning and National Development

CONTENTS

A. NATIONAL INFORMATION POLICY

- a) Introduction
- b) National Information Agencies / Services and Their Legislative and Regulatory Environment
  - i. General information and broadcasting services
  - ii. Scientific and technological information services
  - iii. Public Archives service
  - iv. Public library services
  - v. Academic (University) libraries
  - vi. Multi-sectoral district-oriented information services
  - vii. Government extension services
  - viii. Other information services
- c) Issues to be addressed by a comprehensive National Information Policy for Kenya
  - i. Infrastructure
  - ii. Research and Scientific Publications
  - iii. Extension services and mass media
  - iv. Conferences, seminars and workshops
  - v. Information technology
  - vi. Regional and international co-operation in information exchange
  - vii. Information specialists

B. NATIONAL INFORMATICS POLICY

- a) Introduction
- b) The introduction and application of information technology
- c) Regulations affecting informatics
- d) Existing informatics policies
- e) Future information technology policy
- f) Informatics institutions
- g) External assistance

C. POLICY-MAKERS' VIEWS ON INFORMATION AND INFORMATICS POLICY

a) Policy formulation and implementation
b) Role of sectoral policies
c) National information policy
d) Implementation of a National Information policy
e) National Informatics Policy
f) Acquisition of informatics

D. CONCLUSION

E. REFERENCES

a) Information Policy
b) Informatics Policy

A. NATIONAL INFORMATION POLICY

a) Introduction

Kenya recognizes the important role which can be played by the utilization of national information in development. Support has therefore been given to information agencies and services, including broadcasting services, extension services, libraries, documentation centres, statistical bureau, national archives, national museums and publishing establishments. At the regional and international levels, Kenya has supported programmes and systems aimed at the improvement of collection, storage and dissemination of information. Kenya's supportive commitment to regional and international information systems is demonstrated by its active participation in the AGRIS (International Information System for the Agricultural Sciences and Technology), the New and Renewable Energy Resources Information Pilot System for Eastern and Southern African Region, and moral support for the PADIS (Pan African Documentation and Information System), among others. Internationally, Kenya participates actively in the initiatives of UNESCO's Inter-Governmental Council on General Information Programmes.

Though Kenya does not have one comprehensive information policy, it does have several laws, regulations and guidelines that influence information agencies and services. Their development, functions, operations, and use are briefly described in the following pages.

b) National Information Agencies / Services and Their Legislative and Regulatory Environment

i. General information and broadcasting services

The broader role of the Ministry of Information & Broadcasting is to establish a two way channel of information between the public and the government. The Ministry has major responsibilities for disseminating information on national policies and the progress of developments, summarizing and interpreting complex documents for dissemination, educating the public, and ensuring that public issues are debated.

The Department of information now operates one information office in each of the 41 districts and a Provincial Information Office in each of the 8 provinces. To encourage dissemination of information, the Ministry of Information and Broadcasting "reading rooms" have also been established in many districts. The main organ for gathering and processing of news is the Kenya News Agency (KNA). In its efforts to disseminate information in the vernacular of Kenya's different population groups, the Ministry has, with UNESCO funding, established nine Rural Newspapers.

There are three main laws bearing on the general information and broadcasting services. These are:

(a) The Kenya Broadcasting Corporation (Nationalization) Act [1], Cap. 221, Laws of Kenya, which commenced in July, 1964 provides for public ownership and control of broadcasting by sound and television.

(b) The Film and Stage Plays Act [2], Cap 222, Laws of Kenya, which commenced in October, 1963, provides for controlling the making and exhibition of cinematographic films and for licensing of stage plays, theatre and cinemas.

(c) The Books and Newspapers Act [3], Cap 111 Laws of kenya, which commenced in July, 1960 indicates a provision for the deposit and registration of books and newspapers and also regulates printing of books and newspapers. In accordance with this Act, publishers are required to deposit 3 copies of each book they publish with the Registrar of Societies. The copies are deposited in Kenya National Archives, Kenya National Library Services and the University of Nairobi Library. This method has not been quite satisfactory especially for purposes of production of the Kenya National Bibliography. Consequently, a recent amendment (1987) of this Act, now requires publishers to send 2 copies directly to the Director, Kenya National Library Services, and provides penalties for non-compliance.

ii. Scientific and Technological Information Services

The role of the National Council for Science and technology (NCST) as delineated in the Science and Technology Act of 1977 is to advise on all scientific activities including scientific documentation, statistics, surveys and general information, with a specific objective of establishing a machinery for the collection and dissemination of scientific and technological information. The NCST's operations and procedures are governed by the Science and Technology Act [4], Chapter 250, Laws of Kenya, together with NCST Report No. 4 of 1980 on Science and Technology for Development [5]. The report together with Sessional Paper No. 5 of 1982 [6] specifies the broad objectives and policy issues for the National Scientific and Technological Information Policy.

NCST has established the Kenya National Scientific Information Documentation and Communication Centre (KENSIDOC). The overall broad objective of KENSIDOC is to develop the information services necessary for the elaboration and implementation of Kenya's scientific and technological plans for socio-economic development. The medium-term objectives of KENSIDOC are:

(a) to put at the disposal of planners, research workers, and technologists appropriate tools for the identification of the sources where information needed by them can be found (information referral services);

(b) to provide information on research institutions, research programmes and projects in progress, and research scientists;

(c) to promote dissemination of the results of research undertaken in Kenya and about Kenya by local and foreign researchers, and

(d) to promote strengthening of information activities in priority scientific areas identified in national development plans and strategies (agricultural, health, industrial, energy and development planning).

iii. Public Archives Service

The National Archives is involved in the preservation of important public archives and records which are created in various Government ministries and departments, and other public institutions.

According to the Public Archives Act [7], Chapter 19, Laws of Kenya, public records include the records of any ministry or government department, and of any commission, office, board or other body or establishment under the Government. Also included in this definition are records of the High Court and of any other court or tribunal, the records of Parliament and of the Electoral Commission; and the records of any provincial council, local authority or other authority established for local government purposes. The act further states that public records include not only written records, but also records conveying information of any means whatsoever. Access to public records and archives is clearly set out in Section 6 of Public Archives Act which regulates access to official records.

It has recently been decided that the Government would take firm measures to acquire and preserve reports and other generally circulated documents in the Public Service. Consequently the National Archives has been directed to set up a National Documentation and Information Retrieval Service as one of its major divisions. It is understood from the National Archives that the activities of this division would be linked to libraries and documentation centres in the Public Service. In most cases, access to the reports and other generally circulated documents would not be restricted.

iv. Public Library Services

The Kenya National Library Services (KNLS) was created in 1967 by the Kenya National Service Board Act [8] Chapter 225, Laws of Kenya. The Act which was revised in 1980 and amended in 1984 specifies the following functions of KNLS:

(a) to promote, establish, manage, maintain and develop libraries in Kenya;

(b) to plan and co-ordinate library, documentation and related services in Kenya;

(c) to advise the Government, Local Authorities and other public bodies on matters related to library and related services;

(d) to advise the Government on library education and training needs.

(e) to carry out and encourage research on the development of library and related services;

(f) to participate and assist in campaigns for eradication of illiteracy;

(g) to stimulate public interest in books and to promote reading for knowledge, information and enjoyment;

(h) to acquire books produced in and outside Kenya and such other materials and sources of knowledge necessary for a comprehensive national library service;

(i) to publish the national bibliography of Kenya.

KNLS has already established 14 branch libraries which provide lending and reference service to the public free of charge. The libraries stock material that educates and informs the communities they serve. In addition, all the branch libraries provide books of literary and recreational value for adults and children. KNLS is also a depository library for the purposes of the Books and Newspapers Act. The role of KNLS is therefore two fold: i) that of developing a Public Library Service and, ii) that of a National Library.

v. Academic (University) Libraries

These are libraries which serve national public universities. They are established to serve defined objectives and users i.e., to support the teaching, learning and research activities of the parent institutions. Their main users are staff and students of the parent universities. Regulations governing development and use of each University library are developed by the parent university, which in turn is established by an Act of Parliament. Each public university is a semiautonomous government institution. The polytechnics and other tertiary institutions also have libraries.

vi. Multi-sectoral District-Oriented Information Services

The Government is establishing one District Information and Documentation Centre (DIDC) in each District in support of the national strategy of decentralized planning and development with the district as the focus/basic unit. The decentralized strategy is known as the District Focus for Rural Development and is co-ordinated by a District Development Committee (DDC) for every district. The District Information and Documentation Centre is an important component of the District Planning Unit (DPU) which supports the district's roles in planning and implementing development activities at the district level. The DIDC would provide essential information and baseline data for the District Planning Unit, the District Development Committee and other district development committees.

All published or general circulated documents related to development in the district would be included in the DIDC but all classified documents, reports and correspondence would not be included in the centre.

In addition to providing information to the team responsible for planning and implementing district development activities directly to the public, the DIDC would also play an important role as a reference centre for providing up-to-date development information on the district to the Ministry of Information and Broadcasting and other public media, such as local newspapers.

There are regulations guiding DIDCs on types of documents to be included in the centres stock, procurement of documents, procedures for use of the centres, co-ordination of the centres, etc. Guidelines on Establishment and use of District Information and Documentation Centres [9] are issued in the form of circulars from time to time.

The Ministry of Information and Broadcasting, the National Council for Science and Technology, the Kenya National Archives and Kenya National Library Services co-operate and play a major role in guiding establishment and development of the District Information and Documentation Centres.

vii. Government Extension Services

Consideration of the large segment of Kenya's population which is unable to read or write, especially in the rural areas, has made the role of Government extension services in disseminating departmental information vital. Unfortunately, extension services have tended to be organised along sectoral lines (agricultural, health, community development, etc.), without due consideration that the end user of such information is often one and the same person.

viii. Other Information Services

These are special departmental, research as well as private sector libraries, documentation centres and information services established to serve the immediate objectives of the organization they serve. These libraries are not regulated by central government legislation but are guided by the institutions that they serve. Displays and trade shows, such as agricultural open days and the Agricultural Society Shows, act as shop windows for technological development, particularly in the area of agricultural development.

Other legislation and regulations that have a bearing on the acquisition and utilization of information, include the Copyright Act, the Museum Act, the Statistics Act, the Standards Act, the Foreign Exchange Control Regulations, and Research Clearance Regulations.

c) Issues to be Addressed by a Comprehensive National Information Policy for Kenya

i. Infrastructure

The Government has given support to information institutions and services including libraries, documentation centres, information centres, archives, museums, publishing establishments, broadcasting services, national standards and statistics agencies, and extension services. In general, information institutions in the country are financially weak. Furthermore, the close inter-relationship among these institutions and services is not recognized; this results in a lack of co-ordination among various sectors.

Some of the legal provisions regarding acquisition, depository and retrieval rights have not played a complementary role in guiding proper development of information systems and services, and there is a tendency to duplicate functions. There is need to review and revise legislation governing information agencies and services in order to ensure complete comprehensive coverage and remove ambiguities and duplication in information systems and services. For most decision-makers and many information users, there is inadequate awareness of the importance of information for the national development process. As a consequence, the development of information infrastructure, systems and services is accorded low priority in government development planning and budgetary circles.

There is a need to convince decision-makers to invest increasing funds to improve national information infrastructures and resources. Some long term action is needed in order to develop and sustain a national opinion/attitude that funding of information infrastructure, facilities and technology is an important investment, just as investments are made in industry, transportation infrastructures, etc.

Training of information users in order to improve awareness of the importance of information for the national development process is also an area requiring some long term action if we are to succeed in developing a) users with the reflex of using information, and b) strong support for development of information services.

Recognising the scarcity of information resources, government policy should devise a mechanism for establishing priorities in allocating these scarce resources in order to develop an effective national information infrastructure.

ii. Research and Scientific Publications

Although the nation spends considerable human and financial resources in conducting scientific research, information emanating from such research is not adequately disseminated. Researchers do not indicate comprehensively the literature consulted and/or generated in the course of research. Some results of scientific research end up only in scientific journals, which are accessible to a small group of scientists. Little attempt is made to translate the findings into a language which can be easily understood by a wide range of users. There is also lack of abstracting services which hampers dissemination of research information. The situation is further complicated when Kenyan scientists publish information relevant to Kenya in foreign journals which are inaccessible to other Kenyan scientists.

Whereas considerable research is also carried out by foreigners, such research is of little practical value to the nation as the data generated is seldom deposited in a useful format. In spite of Government regulations that this be done, lack of proper understanding between Government officials and researchers has hampered any such efforts. There is therefore the danger of losing essential research data and that such research could be repeated at a future date.

Many local journals through which scientific papers of national importance could be published have experienced financial difficulties and do not circulate widely.

The lack of national access to international S&T information sources is due to inadequate financial resources given to scientific information institutions and services, and to import control regulations which accord low priority to allocation of foreign exchange for acquisition of publications.

In order to alleviate problems related to research and scientific publications, a national information policy should include a mechanism for ascertaining that final copies of research reports and data are deposited in the country, and that scientists are, as far as possible, encouraged to publish results of their research in local journals. In particular NCST should acquire a specific publishing fund for assisting those good quality local journals that publish Kenyan research but which continue to experience financial difficulties. In addition to publishing in journals, scientists should be encouraged and supported to disseminate their findings in popular magazines, local newspapers and other mass media channels so as to reach the various target groups. The Government should provide adequate financial resources for purposes of obtaining scientific information from external sources.

iii. Extension services and mass media

Very often target groups are not clearly identified and consequently extension workers pass on information which is out of context with the requirements of the target group e.g. information which is applicable to large scale agricultural production is passed on to small scale operators. Usually, there is no feed back mechanism from the extension services which would enable the correction of such situations.

A number of extension agents have not kept abreast with technological developments and are no longer able to disseminate up-to-date information. These include those recruited with very little education and who are nearing retirement age. In many cases the target group they are intended to serve is more enlightened than themselves - this limits the potential for retaining such extension markets.

Mass media is a versatile channel for the dissemination of information and it can be used to reach remote areas with communication problems. Kenya's current rate of literacy and distribution problems limit the usefulness of the print mass media. The high cost of television sets, lack of electricity in the rural areas, and problems relating to repair and maintenance also limit the feasibility of utilizing television for dissemination. The radio, on the other hand, has wider coverage, but its potential has not been fully utilized for dissemination of development oriented information. The establishment of the Rural Newspapers, mentioned earlier in this paper, is a commendable effort by the Government.

Evaluation of the impact of information disseminated through mass media has not been given adequate attention and broadcasts in local languages are often direct translations of scripts written in foreign languages, English and Swahili. This often results in use of terms which distort the intended meaning of information. Accuracy of technology information is not effectively vetoed.

If an information policy is to have the desired effect it should include measures to ascertain that high priority is given to adequate identification of various target groups needing developmental information. Activities of such groups and types of information required, as well as optimum time and channel/method for communicating such information would be useful in compiling appropriate advisory packages (information repackaging), in preparing suitable communication bulletins for respective mass media and also in briefing specific extension workers.

Extension workers serving specific sectors (e.g. agriculture, health, etc.) should be encouraged to familiarise themselves with activities and policies in other sectors so that information emanating from all sectors can be complementary. Co-ordination between various extension services should be fostered so that the target groups can in turn receive more co-ordinated information, especially through the District Development Committees. A stronger working relationship and co-ordination of policies at departmental headquarters should be developed.

A programme of continuous education for extension workers, particularly the ones operating at the grass roots level, should be instituted so that extension service can keep abreast with new developments.

The mass media should be structured to complement extension services. Radio services in particular should be improved and organised so that accurate and timely information can reach clearly identified target groups at the most convenient time. This subject is pertinent to the work of information specialists in various scientific and technological fields.

iv. Conferences, Seminars & Workshops

Conferences, seminars and workshops provide an opportunity for disseminating information particularly on on-going research and unpublished research results, thus reducing chances of duplication of research efforts. A national information policy should encourage researchers attending such conferences, workshops and seminars to deposit copies of papers gathered from such forums at their libraries/information services so that other scientists could indirectly benefit from such conferences, seminars and workshops. It is necessary for decision-makers to participate in these conferences, seminars and workshops in order to: make them aware of the useful research work undertaken in the country; justify the large amounts of public funds utilized in research; persuade them that their country has a vital interest in acquiring and maintaining efficient scientific information systems; and convince them that such systems should be included in the national plans and budgets on a continuous basis.

v. Information Technology

Information technology has been introduced into Kenya's information systems and services without specifications of overall national developmental and information needs to be achieved. This situation has been further complicated by policy- and decision-makers who have often concentrated on the procurement of hardware only, without consideration of human resources for software development and/or adaptation of technology. Lack of co-ordination in the selection and procurement of information technology has reduced the possibility of co-operation needed in the development of national information resources as well as the chance of co-operative efforts to facilitate information exchange at national, regional and international levels.

To have an effective information policy there is a need for an effective national informatics policy. This issue is discussed in greater detail in Section II of this national paper.

vi. Regional and International Co-operation in Information Exchange

There is a need for a national agency to assist scientists, technologists, industrialists and entrepreneurs to access, evaluate and acquire information from regional and international information sources. Such an agency would, in addition, undertake information repackaging, translation, information search and referral services.

There is no government agency designated and authorised to act as the national clearing house for international information transfers. This has resulted in lack of and/or delays in communicating important information to potential users, which in turn has denied Kenya the opportunity of obtaining information from various regional and international information sources. A national information policy should urge the Government to identify or establish a national agency that should function as the national focal point for regional and international information transfers.

vii. Information Specialists

There is a shortage of appropriately trained personnel for all aspects of information services. Within government scientific information services, professionally qualified information specialists hardly exist. Some posts are filled by science graduates without professional skills; others by information assistants who are often not able to do what is required of them. Those who are successful often find their promotion prospects hampered by the lack of higher-level qualifications.

It is apparent that for most decision-makers, there is lack of awareness of the importance of information for national development. Consequently, the status accorded personnel involved in information services is low. This results in low salary levels as well as low morale. Government information specialists, in particular, have no appropriate scheme of service and the existing schemes do not adequately accommodate their various lines of specialisation.

Many in-service information personnel still play a static role at a time when a more dynamic role in transferring information has become vital from various points of view e.g., to facilitate the implementation of the District Focus for Rural Development.

There is a severe shortage of professionally qualified information specialists with training and experience in scientific communications for instance, journalists, editors, broadcasting and newspapers script writers. These specialized communicators are needed by scientific research institutes and organizations, the print media and broadcasting channels.

Computer based information services are not common in Kenya and computer specialists have not therefore been much exposed to information services problems; similarly, information personnel have not been adequately exposed to computers. Kenyan information systems analysts hardly exist in government services and appropriately trained and experienced personnel to develop and/or adapt information technology software are just beginning to emerge. However, the Government has recognized these problems and has initiated training programmes at various national institutions such as the Kenya Institute of Administration and Kenya Polytechnic.

An appropriate national information policy should ensure that a continuous national manpower development programme for training at both certificate and diploma levels is developed and implemented. National undergraduate and post-graduate training programmes should incorporate courses that would train adequate numbers of the various types of specialised personnel needed for information services. In particular, systems analysts and media technology should be included as integral components of information sciences national training programmes.

A mechanism for re-orienting the role/attitude of in-service information personnel from that of passive/static information store keepers to effective information dissemination/communicators and information repackaging agents should be established and implemented. The information policy should encourage training institutions to develop communication skills in all existing and potential researchers in order to facilitate effective communication of developmental research information needed at the grassroots for national development.

The policy should also recognize and address the urgent need to develop and implement a comprehensive scheme of service that would attract and retain a diversified spectrum of information specialists.

B. NATIONAL INFORMATICS POLICY

a) Introduction

This section will examine matters related to national informatics policy. The term informatics has been defined as the totality of disciplines and technologies for the systematic treatment of data and information, particularly with the use of new technology (i.e. computers, telecommunication, telematics and related information handling and processing methods).

b) The introduction and application of information technology

The rate of introduction of information technology, the number and variety of techniques and their applications has been covered in detail elsewhere [1, 2, 3]. MWARA, in particular, has traced this development since 1953, when punch card tabulators were introduced in Government offices and East African Railways in Nairobi. The first computer was introduced in 1961, but growth was slow until 1975; there were 4 mainframes in 1965 and 30 in 1975. By 1981, however, there were 127 mainframes and the number has continued to increase steadily. In 1985, it was estimated that there were about 2000 computers in East Africa, 90 per cent of which were in Kenya with Uganda and Tanzania sharing the remaining 10 per cent [4].

The introduction of minis in the late 1970s and micros after 1980 has contributed to the growth of computer installations. The micros, in particular, have had a significant impact on the public and private sectors due mainly to decreased costs, increased power, portability and user friendliness. They are becoming more popular than the mainframes and minis. There are estimated to be more than 1000 micros in Kenya; this number is increasing constantly. The number of mainframes has been growing by about 28 per cent and forecasts are that there will be a total of 12640 by the year 2000 [3].

Several computer companies market computers and word processors in Kenya. Telecommunications equipment is supplied by various companies but licensing is a monopoly of the Kenya Post and Telecommunications Corporation, a parastatal. International data transmission is most often used by airlines. A number of libraries owned by international organizations have also computerised their services.

The applications of informatics are, at present, restricted to big business organizations, Government, parastatals, banking and some educational institutions. These applications include:

Finance:	payrolls, invoicing, inventory control.
Banking:	in-house administrative functions; customer accounts
Travel Trade:	rolling stock logistics for Kenya Railways: airline reservations and ticketing.
Mass Media:	news agencies e.g. Routers, sending reports to newspapers, radio and T.V.
Telephone:	subscriber trunk dialling and international subscriber dialling, including use of phone cards.
Telereferencing:	e.g. the World Net which has occasionally been transmitted on Kenyan T.V.
Education.	Universities, the Kenya Polytechnic, Starehe Boys Centre and a few secondary schools.
Libraries:	mainly those of international organizations using computers for information retrieval.
Document Production:	Government and micro-computer use by the University of Nairobi Library to produce the Union List of Periodical holdings.

Planners, policy-makers, educationists, researchers and managers have realised the usefulness and potential of micro-computers to provide management with valuable information. Consequently, they have been installed in a number of institutions, organizations, government ministries and parastatals to help improve administration through the provision of better storage and faster retrieval, and for the production of critical documents such as national and ministry budgets, sessional papers, and district plans. With increased awareness of the power of informatics, the utilization of information technology (IT) is likely to increase. Preliminary results of a survey by KAMAU [5] on library computerization in Kenya, shows that several libraries plan to computerise their services within the next few years. The main limiting factors, however, include funding problems, shortage of qualified manpower and lack of local maintenance of the hardware. The greatest impact of information technology in the near future would seem to be in research. The effective use of information stored in libraries will be enhanced as compilation of the national bibliography is completed. The use of IT in libraries will also facilitate resource sharing; the utilization of information through such activities as production of the Union Catalogue; development of selective dissemination of information (SDI) services; and general improvement of user service. In developed countries a number of publications are produced only in electronic form which means that they can be used by the organizations with the right equipment and the ability to handle them. Use of IT in Kenyan libraries will ensure that such material is accessible.

c) Regulations affecting informatics

The importation of information technology is regulated by exchange control regulations which require that an important license and allocation of foreign currency must be obtained before orders are placed. This is time consuming. Depending on the cost of equipment, quality inspection may also be required. Custom duties and sales tax which are currently very high, as well as the small size of the Kenyan market result in very expensive prices at local retail outlets.

Acquisition of IT in government ministries is controlled by internal regulations, governing such aspects as purchase procurement or rental. The Government Computer Service Centre (GCSS) is responsible for the provision of data preparation facilities within government and the procurement of equipment clearing external aid agreements, where provisions exist either for the supply of IT equipment or personnel. It has been observed, however, that the GCSC has no control over the type of equipment, brought in to the country by the private sector and donors. This is the area that needs consideration.

Acquisition of IT is limited because of high costs involved, the effect of import rules and regulations and delays in obtaining import licenses for equipment and spare parts. Software acquisition is also expensive which has led to the pirating of software without regard to copyright. It is clear, therefore, that current regulations have tended to discourage the acquisition of information technology. Import regulations should, therefore, be released and adequate foreign currency provided especially for the IT required for government, parastatals, libraries and education services. Duty and other taxes charged on information technology equipment and software, should also be decreased.

d) Existing informatics policies

There is no comprehensive informatics policy in Kenya, due largely to the inadequate awareness by policy-makers, planners, managers, etc., of the benefits of access to IT for decision-making. This has been compounded by the wide application of computers would cause employment redundancies. Another factor has been the shortage of skilled manpower. Although by 1982 there were 2018 data processing job positions in Kenya, the majority of these were at programming and lower levels including operation, data control and data preparation. At higher levels there was a shortage of appropriate qualified personnel. Existing manpower training facilities are inadequate and the necessary training equipment is lacking. There is also no appropriate professional association to act as a pressure group. There is now, however, a growing awareness of the need to evolve an appropriate policy.

e) Future information technology policy

The application of information technology has been mainly in routine operations such as data processing, payroll and accounting, but almost non-existent in the field of information science. The library and information systems have not been fully developed and this, coupled with inadequate utilisation of information services, has doubtless contributed to the present situation. An effective library and information system would have simulated the use of information technology. The lack of a comprehensive national information policy is a casual factor.

An effective information service requires the use of information technology. Due to the combination of factors, however, chief of which are the lack of funds for books journals, high cost of information technology and inadequate knowledge, the matter of an informatics policy has not been addressed.

Any future policy should take in to account consideration of the following issues:

(i) the use of micro-computers in improving administrative and technical efficiency and providing for the effective decentralized use of information technology.

(ii) the need for co-ordination in training procurement and maintenance.

(iii) the introduction of information technology would not lead to the loss of jobs or increased an employment.

Various bodies and instruments would be necessary to manage the application of micro-computer technology, including:

(iv) a policy steering committee, to be responsible for policy making and guidance; staffing; and, institutional development

(v) a technical sub-committee to deal with procurement drawing up guidelines for the acquisition of equipment; maintenance cost; recurrent costs; and, utilisation;

f) Informatics institutions

IT manpower training is undertaken at the higher levels by the Institute of Computer Science of the University of Nairobi, while the Kenyan Polytechnic undertakes diploma level training. The other public universities have also introduced courses in computing and related subjects. A post graduate course in information technology has been developed in the Appropriate Technology Centre of Kenyatta University. Some private institutions offer courses mainly, in programming.

A number of Government ministries and agencies have made a significant contribution to developing high level awareness of the value of information technology and of the need for co-ordination at the national level.

g) External assistance

The development of effective applications of information technology has been hampered by several problems, chief of which are:

(i) lack of foreign currency;
(ii) shortage of skilled manpower
(iii) inadequate training facilities;
(iv) insufficient industrial infrastructure
(v) absence of co-ordination and co-operation
(vi) lack of awareness of the importance of IT to management and decision-makers
(vii) inadequate information infrastructure.

External assistance would enable the provision of scholarships for external manpower training and funds and equipment to enhance the capabilities of local training institutions. It should be emphasized, however, that donor activity should conform with national regulations in order to avoid multiplicity and the proliferation of equipment without due concern for costs, the availability of spare parts, and servicing facilities.

C. POLICY-MAKER'S VIEW ON INFORMATION AND INFORMATICS POLICY

a) Policy formulation and implementation

Whereas the volume of information as a tool for development defies easy quantitative evaluation using the normal tools of cost effectiveness, its relative indispensability in modern systems planning, organization and analysis can not be over-emphasised.

In many African countries, indeed in most developing countries, the full value and impact of well organised information systems as integral and catalytic tools of national development has yet to be appreciated. The development of information and documentation programmes has usually been haphazard and unplanned. The gap between scientific and technological development in these countries and that attained by information systems and networks is generally quite marked. Considerable resources have been spent on agricultural, economic, educational and medical research, but comparatively little on documentation systems and the training of documentalists both of which are essential for progress in utilization and dissemination of research findings.

Should this situation continue, the economic future of the nations concerned would no doubt be jeopardised. Development can only be achieved through maximum utilization of resources and this in turn depends on the full use of national information. This is secured by the integration into the national effort of well planned and organised information policies, thus permitting the organised flow of information between national, regional, and international networks.

In Kenya, development policies are formulated and implemented through various institutions such as parliament, the ruling party KANU, the civil service, and the cabinet. Policy formulation includes conception; feasibility studies; the identification of aims, objectives and targets; and the drawing up of necessary and relevant documentation. It may be done via specialised ad-hoc commissions, committee and working groups, which collect evidence through research, inter-ministerial groups, public hearings, etc. In the case of multi-sectoral policies, the reports are submitted to the cabinet for consideration and tabled for the national assembly for discussion and adoption.

A number of factors sometimes hinder simplification. These include the lack of effective participation during the formulation stage by those who will be later be expected to undertake the implementation. Poor co-ordination, an inadequate organisational structure, a shortage of financial resources, poor budgeting and insufficient reporting, feed-back and evaluation mechanisms are not unique to Kenya.

In an effort to improve matters the Kenyan government has adopted the District Focus for Rural Development Strategy to ensure that policies are formulated at the community level and are communicated to the highest echelons of decision-making. Once policies are accepted, the process of implementation is transmitted downwards thus insuring maximum acceptability, and minimisation of resistance to new ideas.

b) Role of sectoral policies

Against the background of the growing awareness of the role played by information in planning and development, there is a need for various sectors using relevant institutions and organisations, to develop policies and establish facilities for proper collection, production, processing and dissemination of available information.

Networks and other appropriate infrastructure must be created to link the different institutions and organisations and establish co-operation at sectoral, national, regional, and international levels.

Institutions of higher learning are expected to produce high-level personnel with relevant skills suited to all forms of industry. They also have the responsibility of defining various cases needed in the interest of national development.

Industry, whether public or private sector, should provide goods and services, which play an important role in national development. Since they are complementary, therefore, industry and the institutions of higher learning and research must collaborate for the effective utilization and sharing of existing facilities and services.

c) National information policy

The government of Kenya is keenly aware of the fact that one cannot talk, in a meaningful way, about development without recognising the role that information plays in this pursuit. In the 1983-88 development plan the government made a commitment to cover at least 85% of the national territory with clear radio signals as a major incentive to potential investors, and to provide information on employment opportunities. Personnel training in various fields of information would receive priority, with particular attention to in-service training. Inter- and intra-sectoral co-ordination would receive assistance. The development of libraries in all schools was recommended. Government ministries and departments have established libraries or documentation centres, for example, the DIDCs.

In the field of health services, the Ministry of Health in conjunction with the African Medical Research Foundation (AMREF) is developing reference libraries in each of the district and sub-district hospitals. Health workers using these facilities have been given in-service training on basic library management.

Similarly , the Ministry of Education places growing emphasis on the training of teachers in library organisation skills; the government has also removed taxes on books and other learning materials.

The government would like to see the formulation of a broadly defined national information policy which would help the co-ordination of various sectoral policies. Each sector would remain independent but would co-operate in the areas of inter-lending services, joint acquisition, initialisation, preservation and conservation. A co-ordinating body would be set up and charged with the setting of standards, training , guidelines on co-operation, and interaction with regional and international institutions. Such policy should consider the following areas:

(i) Facilities and Services

Appropriate facilities and services should be ensured for the acquisition, processing and dissemination of the specific information, required in each sector;

Information may be in the form of books, journals, reports, films, unpublished data, etc.

(ii) Labour

There should be an adequate supply of skilled personnel at all levels. Much has already been achieved in this areas, but there is still a shortage.

(iii) Dissemination and Access

Information must be readily available to the potential users. This implies that the category of permissible users must be defined for each type of information and must be recognised that there are some constraints dictated by institutional and sectoral competition or national interest. Different institutions often specialise in given type of information, so that one co-operation avoids the duplication of efforts, which is wasteful, both in terms of resource and time.

(iv) Publishing

The research findings submitted to the sponsoring institutions or organisations must be made available for potential users. In order to disseminate such information, the institutions should document and publish lists of research proposals, findings, and latest publications. This would help to avoid wasteful duplication of effort, and, at the same time, make information available to a larger number of users.

d) Implementation of a National Information Policy

Formulating a national information policy involves information specialists such as librarians, archivists, documentalists, journalists, planners, educators, policy-makers and other information generators. These specialists should also play a leading role in the implementation of any comprehensive policy.

Feasibility studies should ensure that the objectives and targets are in conformity with and complementary to overall national development goals. A balanced plan of action is needed to save resources. Regular evaluations should also be undertaken.

A national policy would help to identify priority areas for allocating scarce financial and human resources. The plan would identify existing gaps in the nations's information needs, manpower requirements, levels and areas of specialisation, and training priorities. A policy would also determine how effectively services are being utilised and provided, as well as what types of institutions to establish and the physical facilities/equipment required.

Several areas require attention in the development of information policy in Kenya. While efforts continue to increase manpower training, there is an acute shortage of specialists in all aspects of information work. Faculties and Information Science and Departments of Library Studies of post graduate studies have recently been established and Moi and Kenyatta Universities respectively. Plans exist for an undergraduate programme at Kenyatta University, and for a diploma course in library and archive studies at the Kenyan Polytechnic Institute.

It is the Kenyan government's view that information priorities must accord with established national development priorities. Emphasis will thus be given to the priority sectors such as agriculture, economic planning, industry, primary health care and population planning.

e) National Informatics Policy

In recent years, there has developed an ever increasing awareness of the role played by information in the development process. Farmers become aware of the latest method of increasing yields to feed an increasing population; industrialists acknowledge technologies necessary to achieve high productivity. Initially, the increasing reliance on information was largely attributed to industrialization, expansion in education, and increase in research. More recently, the impact of modern technology, especially the applications of computers, has greatly increased the impact of informatics on the organisation of systems, planning and development. At what ever stage of development of the country, however, the basic information needs still persist. Without the right information technologies, no system will function effectively.

The trend in informatics is such that Africa can no longer afford to ignore the latest available technologies.

f) Acquisition of informatics

The acquisition of informatics has continued to receive much Government support given the limitations of foreign exchange requirements. Support has been given to manufacturers to encourage local assembly, and a number of companies are taking advantage of special programs. Duty and sales tax have recently been reduced, and it is Government's hope that these can be reduced even further in order to make these products cheaper and more easily accessible. The combination of these factors has led to a sharp increase in the importation and use of information technology.

D. CONCLUSION

The objective of a national information and informatics policy must be to ensure that key information requirements of the nations are met, and that end users have access to and can fully utilize the available information to effectively carry out their respective functions. In order to ensure this, developing countries must undertake major investments in the acquisition and delivery of information, its organization, storage, retrieval, and dissemination as well as the management of libraries, documentation centres, archives, etc.

In this area, developing countries have a major advantage. They have an opportunity to use the latest information technologies to expand their national networks, develop regional networks, and link up with global networks. Elsewhere, one Mexican writer has stated:

> "Countries that have not yet developed or fully developed their national information networks are not two or three decades behind the highly industrialised and post-industrial countries, because the information on today's technology, and also future forecasting is available. It is more frustrating because there is an awareness of existing technology but yet in many cases, an incomplete and heterogenous infrastructure delays the adequate implementation of today's technological possibilities within the information science field."

This comment applies well to Kenya. Kenyan, indeed African, institutions have yet to move aggressively into using modern technology, especially in the presence of advanced telecommunications networks, in order to take advantage of existing information systems and networks.

E. REFERENCES

a) National Information Policy (Section A)

1. REPUBLIC OF KENYA. The Kenya Broadcasting Corporation (Nationalisation) Act Chapter 221, Laws of Kenya. Nairobi: Government Printer, 1967.

2. REPUBLIC OF KENYA. The Films and Stage Plays Act, Chapter 222 Laws of kenya, Nairobi Government Printer, 1963.

3. REPUBLIC OF KENYA. The Books and Newspapers Act, Chapter 111, Laws of Kenya. Nairobi Government Printer, 1962

4. REPUBLIC OF KENYA. The Science and Technology Act, Chapter 250, Laws of Kenya. Nairobi Government Printer, 1980.

5. NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY. Science and Technology for Development: a report of the National Council for Science and Technology, Nairobi, NCST, 1980 (NCST No. 4).

6. REPUBLIC OF KENYA. Sessional Paper No. 5 of 1982 on the acceptance of the Report of NCST No. 4 dated 1980 entitled Science and Technology for Development. Nairobi. 1982.

7. REPUBLIC OF KENYA. The Public Archives Act, Chapter 19, Laws of Kenya. Nairobi Government Printer, 1967.

8. REPUBLIC OF KENYA. The Kenya National Library Service Boards Act, Chapter 225 Laws of Kenya, Government Printer, Nairobi, 1967.

9. REPUBLIC OF KENYA. Establishment and Use of District Information and Documentation Centres. Nairobi Office of the President, 1986.

b) National Informatics Policy (Section B)

1. SCOTT, R.J.P. Computers in Kenya: Report on IDRC sponsored projects

2. PRICE WATER HOUSE ASSOCIATES. A survey of Computer Technology and Software in Kenya.

3. MWARA, N.K. Issues on Computer and Development- A Kenya perspective . Information Technology for Development, 1 (2) 1986.

4. EASTERN AFRICAN COMPUTERS NEWS, 1 (1) 1985

5. KAMOU, G.W. Trends in Application of Computers in Kenyan Libraries: a Survey of Kenyatta University

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

BOTSWANA: DEVELOPMENT AND CO-ORDINATION OF INFORMATION AND INFORMATICS POLICIES

A. Datta

M. Baffour-Awuah

National Institute of
Development Research and Documentation
Gaborone, Botswana

CONTENTS

A. INTRODUCTION

B. INFORMATION FOR DEVELOPMENT

C. THE INFORMATION SCENE

D. THE INFORMATICS SCENE

E. LEGISLATIVE ENACTMENTS AFFECTING INFORMATION AND INFORMATICS

F. TRAINING OF INFORMATION AND INFORMATICS PROFESSIONALS AND PARA-PROFESSIONALS

G. CONCLUSION

H. REFERENCES

A. INTRODUCTION

This paper presents an overview of the development and co-ordination of information and informatics in Botswana. It identifies the factors which, according to the authors, make it necessary for the country to evolve a national policy in this field.

It would be presumptuous on our part to speak about information and informatics from the viewpoint of policy-makers. Indeed, as said elsewhere in the paper, the country, still without a national policy on information and informatics, is currently examining the need for formulating such an information policy, which is expected also to cover the use of informatics.

What follows in this paper represents the practitioner's perspective, tempered with a reconstruction of the policy-makers' viewpoint. The latter is feasible because a country like Botswana has only a small community of information workers and specialists; consequently, the interaction among practitioners and policy-makers is frequent and close, especially when contact between the two groups is institutionalized as it is through the Information and Documentation Co-ordination Committee (IDCC). It is useful to remember that this body functions with the blessings of the Ministry of Labour and Home Affairs (MLHA), an approximation of an inter-sectoral consultative body.

The present paper is divided into seven sections. A short introduction is followed by a general discussion of the importance of information in the development process. An attempt is made in the following section to trace the developments leading to the establishment of a mechanism for the creation of a national co-ordinating council for information. Some of the special problems surrounding the informatics scene are then discussed with particular reference to what a national policy could do in regard to the use and co-ordination of informatics. This is followed by a short description of the legislative measures that govern or that should be enacted to govern the information and informatics industry in Botswana. The next section presents an overview of the training facilities available in the country for information professionals and paraprofessionals. Finally, the concluding section highlights the main points of the paper. As has been pointed out before, the practitioners' perspective has, throughout the paper, been presented in relation to what has been perceived as the policy-makers' point of view.

B. INFORMATION FOR DEVELOPMENT

The interface between information and development is widely recognized, but its precise nature is not always spelt out. However, the following functions of information are generally held to be relevant to development.

Information has some contribution to make at practically every stage of the development process. Information is needed for finding out the areas which are economically stagnating; comparing and contrasting the performance of different sectors of the economy; and identifying the fields which are likely to yield the largest dividends at the quickest pace. The relevance of information to sectoral and project evaluation is also broadly acknowledged as is its role in helping planners look afresh at development alternatives. Information has, therefore, to be harnessed, like any other national resource, to the task of building the country. This could understandably be facilitated if there were a well-thought-out information policy, with a specialized body to administer it.

The pertinence of information to every field of administration and development has taken a dramatic upswing in the post-World War II period because of the speed with which information is being accumulated. According to one estimate, available information in the world is increasing by 100 percent every 12 years now, but by the end of the century it will double itself in one single year [CABECEIRAS, 1982: 4]. Knowledge leads to power, and accumulated knowledge may mean concentrated power. If democracy in politics is to succeed in Botswana, or for the matter anywhere in the world, it must be sustained by an equitable distribution of knowledge in society, which means that there should be, as far as possible, free flow of information. This can be achieved except only through a collective and co-ordinated effort by means of a partnership between the government and private and quasi-official agencies dealing with information. Co-ordination of this sort obviously needs appropriate legal and financial backing.

C. THE INFORMATION SCENE

That the Government of Botswana has a heavy stake in the information industry should be clear to anyone. Considerable amounts of money have been spent on the Botswana National Library Service (BNLS), the National Archives, Radio Botswana, and the Central Statistics Office. From a modest start, the University of Botswana, including the National Institute of Development Research and Documentation (NIR), has grown into an impressive organization. A Government Computer Bureau and a Computer Steering Committee have been functioning for some time. Many ministries have now started their own research wings, generating specialized information. All these information agencies, manned by their own specialists, have developed separate information policies aimed at satisfying their own specific needs without any attempt to share the available resources. This state of affairs has led to an unnecessary duplication of work, leaving at the same time sizable gaps in the provision of information.

For example, at present there is hardly any information available on leisure-time activities of the youth, or on the elderly, or on the institutions of family and marriage among the urban population, or again, on the disabled.

There are, furthermore, many mundane reasons why some co-ordination of the information industry is necessary. A country like Botswana needs the creation and strengthening of information networks which is best achieved through a central organization. Such an organization can also monitor the integration of library and other information services as essential components of the networks. there is, in addition, the need for what has been called 'information audits' to identify the gaps of the neglected areas of data coverage as well as to set the standards of different data systems. Presumably this could be facilitated with the help of a national inventory of resources and services.

For Botswana, which is faced with an acute shortage of highly trained labour, the development of staff in the field of information management is of great importance. So is the need to assess users' requirements and provide users' education. Once again a central representative body is likely to be the most convenient mechanism to advise the government on how best these can be done.

Last but not least, the formulation of a national information policy may, with good effect, be entrusted to a national co-ordinating body. Such a policy would not only set out the basic principles in terms of which the above mentioned goals would be fulfilled. It would furthermore consider the far reaching implications that any link-up with specific international networks may have. A national information policy will from time to time set out the priorities in information collection and also suggest mechanisms for information sharing, not merely among government institutions, but also between the government and the private sector. Additionally it would have to address itself to the tasks of formulating a policy of work force development in the information industry, building an appropriate infrastructure, the introduction and use of innovations, the location of the focal point(s) and lead institutions, the definition of the status of information workers, and the tricky problem of finances. finally, a national policy should also define the scope of the policy and its links with different areas and sectors of development.

More specifically, the task of policy formulation would entail: (a) an assessment of the existing information situation including the types of services available, the extent to which they are used, and the types of users; (b) a survey of the requirements of different categories of people for information; (c) the formulation of the aims and objectives to be pursued in the information sector and the manner in which they are to be realized; and (d) the endorsement of the policy by the relevant authorities.

The interest of the Botswana Government is in a co-ordinated approach to the generation, management, dissemination and use of information was partly aroused by the events surrounding the rise and fall of the Southern African Documentation and Information System (SADIS). In 1982 a joint consultative committee meeting was held in Harare aimed at setting up SADIS as an information system for the Southern African Development Co-ordination Conference (SADCC) region. The meeting was co-sponsored by United Nations Development Programme (UNDP), Pan African Documentation and Information System (PADIS) of the United Nations Economic Commission for Africa, and the African Bibliographic Centre, a non-governmental organization based in Washington, D.C. (U.S.A.). The representatives of Botswana at the meeting were drawn from major research and information organizations. They formed a SADIS Ad Hoc Committee aimed at co-ordinating regional information activities. The idea was that in order to gain the maximum benefit from the move, the organization should embrace a large number of agencies involved in the generation and consumption of information.

This led to the emergence of the SADIS Reference group which was to be renamed SADIS Standing Committee. When, unfortunately SADIS did not take off, the Botswana SADIS Ad Hoc Committee in Botswana regrouped at national level and changed its name to Information and Documentation Co-ordination Committee (IDCC). A national base for the IDCC was established at the National Institute of Development Research and Documentation (NIR). This is chaired by the Deputy Permanent Secretary for the Ministry of Labour and Home Affairs (MLHA).

Since this development, the IDCC has been a focal point for national and regional information issues, projects, etc. In 1985, a conference on information and resources sharing in Eastern, Central and Southern Africa was held in Tanzania, co-sponsored by UNESCO and IDRC in collaboration with the Tanzania Library Association. The conference went beyond looking at resource sharing to consider the formulation of national information policies as viable proposals in participating countries. Subsequent to this, UNESCO commissioned a consultant to examine the possibility of information sharing among Botswana, Malawi, Zambia and Zimbabwe. Amongst other things, the consultant was to identify the most suitable body to co-ordinate information activities and organize resource sharing at the national level.

Following the report, UNESCO asked IDCC to organize a seminar on the formulation of a national information policy for Botswana. IDCC agreed on condition that they be allowed to arrange a seminar aimed at the emergence of an information council which would have the responsibility of formulating an information policy as well as the long term role of co-ordinating the generation, storage and retrieval of information. Two seminars took place in quick succession thereafter. The first, in February 1987, was regional in scope and drew participants from most of the SADCC countries. Among other things, it recommended that the Government should, through the Ministry of Labour and Home Affairs, legislate from the creation of a national information co-ordinating body with the specific duty of formulating a national information policy that would involve all sectors of the national economy. This seminar was jointly sponsored by the German Foundation for International Development (DSE) and UNESCO.

The second seminar, held in July 1987, involved twenty-six participants representing sixteen major institutions dealing with information. This seminar appointed a Drafting Committee to prepare a report dealing with the following issues that would be the basis for the establishment of a national co-ordinating council for information for Botswana:

a) Identification of resource persons;
b) Background to the national co-ordinating council for information;
c) Functions of the council;
d) Structure of the council;
e) Proposed national research council: its possible relationship to the proposed national information;
f) Finance and budgeting

The report was discussed at a seminar held in Gaborone in July 1988. The seminar requested the Committee to review the report in the light of the suggestions made at the seminar and to send an abridged version to the Ministry of Labour and Home Affairs for submission to Government sometime in 1989.

A close look at the developments leading to the present situation helps us identify the actors that have played a key role in the course of events. These were the information specialists in different government agencies - mostly attached to the Ministry of Labour and Home Affairs, the University of Botswana and other organizations such as the Botswana Technology Centre (BTC). The private sector, including the mining companies, has so far been absent - a phenomenon to which any future strategy for evolving a national information policy has to address itself.

Among information specialists, the most important part was played by librarians and documentalists; specialists engaged in other fields, at best, played second fiddle. Although machine readable information is assuming an increasingly significant share of the country's information industry, computer specialists have not so far come to the forefront of the present move to institute greater co-ordination among its different sectors. Thus, for instance, of the 26 participants at the July 1987 seminar on the establishment of a national co-ordination council for information, 17 were librarians and documentalists, while only two were computer professionals. Again, the committee which drafted "A Report on Co-ordinating Information Services in Botswana" included two librarians and no computer specialist.

D. THE INFORMATICS SCENE

In line with its economic policy, Botswana pursues a laissez-faire approach in informatics. The decision whether or not to make use of an innovation is left mainly to individual organizations. The import of equipment and consumables is largely free from official restrictions within the Southern African Customs Union (SACU) which comprises the Republic of South Africa, Botswana, Lesotho and Swaziland. As the Republic of South Africa is technologically the most advanced of the four countries, informatics application of the Republic basically conditions trends elsewhere in SACU, including Botswana. This can be observed in the use of equipment employed for the acquisition, analysis, storage and retrieval of machine readable data. According to a recent report, the annual sale of computers by one firm in the country increased from 20 in 1979 to 800 in 1987 [Botswana Daily News, 19 January, 1988]. Most of this equipment was imported from South Africa, which also supplies spare parts and, in some cases, services the equipment.

Along with an increase in the number of computers, Botswana has been witnessing a fast expansion in the uses of computer technology. In government work, computer technology has found its place in (i) accounts and bookkeeping, (ii) preparation of payrolls, (iii) motor vehicle licensing, (iv) income tax and customs records, (v) the administration of postal money orders, (vi) the maintenance of census records and (vii) the organization and maintenance of criminal records. It is thus seen that in the four stage developmental model [ZWANGOBANI, 1988: 5-7], Botswana falls in the second level of computer use.

The extent and range of computer use may be illustrated with reference to the Geological Survey Department. Currently this department has ten computers, but they are of four different brands. There are five machines from one brand, but they are all different models. The available equipment is used in a variety of different ways among including the maintenance of waterhole records and computation of mineral reserves, especially diamond and coal ore. Computers are also used in geophysical and chemistry research, in the latter case to produce analytical results for laboratory experiments.

While leaving a relatively free hand to the private sector in the use of computer technology, the Government of Botswana is cautious about the adoption and application of innovative informatics techniques. Policies governing the activities of various ministries and other agencies of the Government in the acquisition and use of both hardware and software are monitored by the Computer Steering Committee which also oversees the standardization of public sector database systems as well as staff training. The implementation of the Committee's decisions is the responsibility of the Government Computer Bureau which also provides technical expertise for the co-ordination of computer use in the country. More concretely, the Bureau provides comprehensive data processing services to fifteen government departments in seven ministries. It also engages in the evaluation and review of the existing systems. A second area of Bureau operations is the development of standard procedures and norms for agencies using computer and the formulation of guidelines for the procurement of both hardware and software. Additionally the Bureau provides facilities for the training of computer technicians and other categories of civil servants who are expected to utilize computer technology in the performance of their duties. Although basically a Government agency, the Bureau is entrusted with the task of counselling and assisting the parastatal sector in computerization.

The Government Computer Bureau has a staff of 62, of whom more than 20 are computer professionals. Its mainframe consists of an ICL 2966 16Mb mainstore, a 3.1 Gbyte filestore, 2 line printers, 4 tape drives, 123 terminals, cluster controllers and 17 low speed printers.

The Government controls informatics applications indirectly providing the infrastructural basis for innovation. An interesting example can be furnished with reference to the adoption of telefacsimile (fax) facilities. In Botswana fax was introduced in 1987 when the Botswana Telecommunications Corporation (BTC) opened a facsimile terminal at their public counter in Gaborone, followed by a second terminal in Francistown. One year later, the national telephone directory printed a list of fax subscribers. By 1988, there were and by early 1989 the number of subscribers rose to 327. Other innovations in the telecommunications area include computerized exchange of information or (telecomputing) and remote sensing.

Direct interaction among computer users through computer networking and the use of the modulation-demodulation (modem) devices (connecting a computer with a telephone and appropriate software) has increased dramatically in the West; however, this has yet to penetrate most Third World countries. Only a handful of such networks have been set up in the Third World. In Botswana, the Botswana Telecommunications Corporation (BTRC) and Air Botswana, both parastatals, operate a system involving international networking. A private organization is attempting to set up a local network of computer users; the next step will be to establish links with a similar network in another country (e.g., Zimnet in Zimbabwe) through which direct international exchange of computerized information would be possible.

Certain conclusions about networking in Botswana can be drawn:

a) Although a phenomenal increase in computer use has been registered in Botswana during the last decade, direct international interaction, or even interaction within the country, through networking has yet to become a reality. This is surprising because international networking is cheaper in the long run and cuts down significantly on the time taken to collect information from abroad.

b) In similar cases Botswana has enthusiastically opted for an innovation by which to make the maximum and most efficient use of information flow from outside. Neither Government nor the private sector initiated any action in this regard.

International computer networking contributes to the dissemination of information; remote sensing is, on the other hand, a technique for collecting information. Developed in the 1970s, remote sensing consists of a method to collect geographical, geological, hydrological, military, and meteorological maps through the processing of data relayed by satellite pictures. No African country has yet placed a satellite into the orbit. Remote sensing data in Botswana is available from two externally-launched satellites. The reception of such data is dependent on the availability of sophisticated equipment and expertise, for which Botswana relies on the Satellite Remote Sensing Centre Johannesburg.

Images are processed through collaboration with the Federal Republic of Germany, while interpretation of pictures is done at the Geological Survey Department, the Meteorological Services, and the private mining giant, the Anglo-American Corporation. These organizations also comprise the major consumers of remote sensing data in Botswana; additionally, about half a dozen private prospecting companies also make use of information obtained through remote sensing.

Another way to control or encourage the use of informatics innovations is through financial allocations. As noted above, the purchase and use of computer hard- and soft-ware, standardization of the databases, and staff training are closely monitored through the Government Computer Bureau operating under the wings of the Computer Steering Committee. Provision of funds is on the whole liberal once the Bureau has approved a request. Botswana has also been fortunate in receiving generous donations of computers from different donor agencies.

In sum, the introduction and use of informatic innovations in Botswana has been fragmentary and haphazard - a state of affairs which calls for their careful co-ordination. An informatics policy would bring order where presently chaos reigns. The chaos is born of competing pressure groups advocating different options, not all of which are compatible. This is most clearly demonstrated with reference to what has been happening in electronic data processing.

In this field, rapid obsolescence of what were once regarded as innovations and the high cost of maintenance, repair and after sales service contribute to the discomfiture of ordinary computer users. At the same time, the attempts to overcome the incompatibility of many devices through jerry built solutions do not necessarily clarify the situation. A well-thought-out informatics policy would ensure that selected hardware and software were used rationally, thereby resulting in considerable economies.

Why is it then that a fully fledged information and informatics policy has not yet emerged in Botswana? This has been due partly to a legacy of the past. Growth of interest in information and informatics has been generated by the information explosion which has come to the fore dramatically only in the wake of the electronic revolution. Usually, there is a time lag between a technological innovation and a corresponding policy development. The field of information has proved to be no exception.

The situation is complicated in Botswana by the structure of the Government machinery which deals with information compartmentally. The Office of the President has a Department of Information and Broadcasting, while the National Archives and the Botswana National Library Services are within the Ministry of Labour and Home Affairs. The Central Statistics Office (CSO) is a part of the Ministry of Finance and Development Planning, although its professional officers are seconded to different ministries.

Botswana needs an informatics policy that is deliberately formulated - not one which shapes itself out of non-action or from a series of ad hoc responses to emergencies from different agencies. If it is the intention of the policy-makers to let things alone, it should be said so openly and in unambiguous terms. However, it seems that the time has come to affirm that Botswana needs a better strategy for dealing squarely with the far reaching implications of the developments that have been taking place on the information front.

While in no ways advocating a policy of regimentation, there should be broad guidelines for specific informatics applications. Some of the issues to which an informatics policy should address itself may include:

a) Adoption and application of modern informatics technology for a more efficient administration of the information industry, including the collection, categorization, storage, retrieval, dissemination and use of information;

b) Equitable distribution of informatics facilities among various regions and sections of the population;

c) Promotion of greater co-operation among SADCC countries with a view to lessening the dependence on South Africa;

d) Co-ordination of the activities of the public and the private sectors with regard to the use and application of the same techniques such as remote sensing or operations connected with computerized databases;

e) When, as in the case of the acquisition and transfer of computerized information, there are alternative choices, some rationalization in the selection and use of the hardware instead of leaving the field open entirely to the interplay of market forces. This problem has been noted in the National Development Plan 1985-1991 [Ministry of Finance and Development Planning, 1985:340];

f) Keeping people informed of recent trends in informatics development and of the availability of new equipment and facilities both at home and abroad.

An informatics policy is of national importance; its formulation should thus involve the widest possible consultation in the country. This is also in accord with the modus operandi of Botswana's decision-making process. The principal actors in this scenario can be identified as the:

a) Department of Information and Broadcasting, Office of the President;
b) Agricultural Research Department, Ministry of Agriculture;
c) Central Statistics Office, Ministry of Finance and Development Planning;
d) Government Computer Bureau, Ministry of Finance and Development Planning;
e) Medical Statistics Department, Ministry of Health;
f) National Archives;
g) Botswana National Library Service;
h) Meteorological Services Department;
i) Botswana Telecommunications Corporation; and
j) Geological Survey Department.

Some nongovernmental agencies are also expected to play an important part in the process. These include the:

k) University of Botswana Library;
l) Department of Library Studies, University of Botswana;
m) National Institute of Development Research and Documentation (NIR) University of Botswana; and
o) Botswana Technology Centre.

Attempts should also be made to associate computer users from the private sector, such as De Beers Botswana Mining Company at Jwaneng and B.C.L. of Selebi-Phikwe, as well as firms selling computer hardware and software. Lastly, one way of paying tribute to the efforts of individual computer users would be to include in the policy formulating body a representative of the Gaborone Computer Study Group which has been meeting every month since 1985 to exchange views and to deal with problems relating to informatics application.

What is the role of external agencies in the developments foreseen in this paper? In the first place, no one can ignore the vital role played by UNESCO in initiating and strengthening the global process of information co-ordination. As early as 1971 UNESCO sponsored an intergovernmental conference to consider the creation of the United Nations Information System in Science and Technology (UNISIST). The conference recommended, inter alia, the establishment of a national agency "to guide, stimulate and co-ordinate the development of information resources and services" for promoting co-operation at different levels: national, regional and international." The idea was subsequently broadened to include knowledge not related to science and technology as well as to numerical data under a new designation, the General Information Programme (PGI, which is its French acronym).

UNESCO has also taken a keen interest in the developments taking place within member states. Its Medium Term Plan (1984-1989) aptly reflects such an interest insofar as it seeks to extend help to developing countries for the formulation of national information policies and guidelines with a view to deciding the most effective means of co-ordinating national information services.

UNESCO's help has been supplemented by the assistance and guidance of the ECA Pan African Documentation and Information System (PADIS). Botswana's information industry has also been receiving assistance from various donor agencies including the International Development Research centre (IDRC) and the German Development Agency (DSE) play an important role. There is a general feeling among policy-makers that external assistance will continue to play an important part in the development of the country's information industry in the foreseeable future. Of course this should not prejudice the move to national self-sufficiency in information development and administration.

E. LEGISLATIVE ENACTMENTS AFFECTING INFORMATION AND INFORMATICS

The formal framework through which any policy is sustained is comprised of the relevant laws. Principal among Botswana's laws dealing with the administration and co-ordination of information is the Anthropological Research Act of 1968 (initially designated as the Bushmen Protection Bill) which enables the office of the President to operate a research permit system. Copies of the permit are lodged with the National Library, National Archives and the National Institute of Development Research and Documentation . Researchers are required to deposit a copy of their findings in each of the first two institutions.

Other legislation deals with the establishment of agencies for storing and dissemination of information. A case in point is the Botswana National Library Service Act of 1967 (amended in 1970 and 1978), section 10 of which attempts to regulate copyright. A second example is the University of Botswana Statutes (1982) which provides the legal basis for the NIR. Similar laws have led to the creation of National Archives, Radio Botswana and the Botswana Press Agency. Mention should also be made of the Printed Publications Act of 1968 which requires the registration of newspapers published in Botswana and of those published elsewhere but distributed in the country.

Finally, there is the law governing the protection of the copyright of information as enshrined in various copyright conventions. However, Botswana's position in this respect is not without ambiguities. The situation is still governed by the British Order-in-Council no. SI 2009 of 4 December 1965. Under this, it is unclear which convention - the Berne Convention (1948) or the Universal Copyright Convention (1952) - Botswana subscribes to, and whether or not Botswana is a member of or is somehow bound by either or both of them [PARSONS, 1982: 9].

The Copyright Act of 1965 was amended last. Consequently the Act does not reflect the enormous changes that have taken place in the information sector over the last two decades. Its elaborate provisions cover literary, dramatic and musical works industrial designs, photographs and cinematographic films, and radio and television broadcasts. There is no mention of computerized databases, software packages or the various types of computer-based models and programme designs which involve the use of new informatic technologies. The great speed with which machine readable data systems are being adopted by public and private sector organizations, and the very real danger of 'piracy' which haunts the generators of new information, suggest that major changes in the Act are urgently called for.

F. TRAINING OF INFORMATION AND INFORMATICS PROFESSIONALS AND PARA-PROFESSIONALS

Any policy for the co-ordination and development of information has to take cognizance of the need for training information professionals. Formal training in the information sector involves pre-service and in-service instructional programmes in the use of information and informatic technologies. Of these, training in library science is provided by the department of Library Studies of the University of Botswana through its certificate, diploma and degree programmes. Recently attempts are being made at the department to mount a programme at the master's level. Additionally, the Department, as well as the Botswana National Library Service (BNLS), organize in-service courses librarians and documentalists. Short-term attachment of documentalists from neighbouring countries is possible at the NIR.

Training in computer use and technology in the country suffers from the absence of a systematic and well co-ordinated programme. There is no formal training leading to the BA/BSc degree for computer professionals, not to speak of a higher programme at the Master's and doctoral levels. However, the University of Botswana offers courses in aspects of computer use, programming and hardware management which are built into certain programmes of the faculties of social sciences and natural sciences. The Botswana Polytechnic and the Botswana Institute of Administration and Commerce (BIAC) likewise provide tuition in computer use and management. In addition, courses for beginners are available at the Institute of Development Management (IDM) and certain private organizations, such as the Computer Academy of Gaborone. Mention should also be made of the short training courses for specific purposes e.g., word processing, data base management and spreadsheets which are mounted by the leading dealers of computer hardware and software. Finally a number of organizations provide in-service training for their own staff - two examples being the Computer Centre of the University of Botswana and the Government Computer Bureau.

G. CONCLUSION

Botswana, like many other countries, has been experiencing an information and informatics explosion. Much of this has been taking place, conventionally, in the world of media served by the printed word; but an increasingly larger part of this development is being accounted for by machine readable data. The country is still without a coherent, well thought out, and deliberately formulated information and informatics policy. However, some progress has been made in this direction with the creation of the Information and Documentation Co-ordination Committee (IDCC) under the aegis of the Ministry of labour and Home Affairs. A small group set up by IDCC is now busy preparing the documentation to be laid before the Government for the establishment, on a permanent footing, of what is being referred to as the National Co-ordinating Council for Information (NCCI). It is expected that NCCI will be eventually entrusted with the task of formulating a comprehensive information and informatics policy for the country.

H. REFERENCES

1. BAFFOUR-AWUAH, M. "Establishing a National Co-ordinating Council for Information: Analysis of Questionnaire Answers." Document prepared for the Drafting Committee of the Information and Documentation Co-ordination Committee (IDCC), 1987. Gaborone: 1987.

2. BOTSWANA: MINISTRY OF FINANCE AND DEVELOPMENT PLANNING. National Development Plan 1985-91. Gaborone: 1985.

3. BOTSWANA TECHNOLOGY CENTRE. "The National Research, Science and Technology Council". Gaborone: 1988.

4. CABECEIRAS, J. The Multimedia Library. New York: Academy Press, 1982.

5. DATTA, Ansu; Basimane Garebakwena; Lucas Owuor-Omondi and Margaret Baffour-Awuah. A Report on Co-ordinating Information Services in Botswana. Gaborone: 1988.

6. GIBBONS, F. "Educating and Training of the Information Workforce for Development". Paper presented at the seminar on the establishment and management of a national information service in Botswana. Bonn: DSE, 1987.

7. HUMPHREYS, H.J. "National Information Policy". In: Library Association Records, 86, Sept., 1974.

8. HUTTEMANN, Lutz (ed.) Establishment and Management of a National Information Service in Botswana: Report of a Workshop held in Gaborone, Botswana, from 23rd to 27th February, 1987. Gaborone: Botswana National Library Service and German Foundation for International Development - DSE, 1987.

9. INFORMATION AND DOCUMENTATION CO-ORDINATION COMMITTEE (IDCC). "Seminar on the Establishment of a National Co-ordinating Council for Information: Agenda and Background Paper, July 27, 1987." Gaborone: 1987.

10. INGANGI, Francis. "Information and Documentation Service for Development of Africa: A Case Study of Southern Africa." Gaborone: National Institute of Development Research and Documentation, 1980.

11. MADE, S.M. Africa Regional Project on Resource-Sharing in Southern and Central Africa - Feasibility Study (Part I). Paris: UNESCO, 1987.

12. MOTLHATLHEDI, M.L. "Government Computer Bureau: Installation profile. "(Unpublished manuscript). Gaborone: 1989.

13. MULINDWA, Gertrude. "Legal Deposit in Botswana." (Unpublished manuscript) Gaborone: 1988.

14. NAMPONYA, C.R. *et al*. "Report on the Seminar on the Establishment of a National Co-ordinating Council for Information held on the 27th July at Gaborone Sun, Gaborone, 1987". Document prepared for the IDCC, 1987. Gaborone: 1987.

15. PARSONS, Neil. *The Research Sector in Botswana: A Survey Conducted on behalf of the Royal Norwegian Ministry for Development Co-operation.* Gaborone: NORAD, 1987

16. SENABYE, Jeremiah. "Modern Technology: Computerization Takes Botswana by Storm." *Botswana Daily News*. 19 January 1988, p.4.

17. UNESCO. *Guidelines on International Information Policy: Scope, Formulation and Implementation: Report*. Paris: 1985.

18. ZWANGOBANI, Elliot. "Review of Literature on Informatics Policy in Selected African Countries South of the Sahara". Paper presented at the PADIS/IDRC Seminar on National Information and Informatics Policies in Africa, Addis Ababa, 28 November - 1 December 1988.

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

ZIMBABWE: STATUS OF INFORMATICS

E. Zwangobani
NCR Zimbabwe

CONTENTS

A. INTRODUCTION

B. CURRENT STATUS OF INFORMATICS

- a) Government
- b) Private Sector

C. TELECOMMUNICATIONS

D. SOFTWARE HOUSES

E. CONSULTANTS

F. EVALUATION AND TRAINING

G. POLICY AND KEY ACTORS

H. THE COMPUTER IN ZIMBABWEAN SOCIETY

- a) Centralization
- b) Acquisition of Hardware and software
- c) Telecommunications
- d) Expatriates

I. INDUSTRIAL INFRASTRUCTURE

J. CONCLUSION

A. INTRODUCTION

This paper assumes that informatics is largely driven by computer technology. Consequently, developments in computer technology will be the focus of this discussion.

Computer applications can be characterised by two phases of development. "Phase I" applications automate clerical functions i.e., payroll, general ledgers, accounts, etc. These types of applications carry out what would otherwise constitute manual tasks. Computers carry out these tasks more efficiently and at lower cost. "Phase II" applications include on-line, real time interaction with the computer that bring about increased organisational effectiveness. These type of applications also integrate the computer into the decision-making process. These are referred to as decision support systems.

B. CURRENT STATUS OF INFORMATICS

a) Government

The Government, with large computer installations, is the largest user of informatics in Zimbabwe. Almost each parastatal has its own computer centre or is linked to one, while the majority of computer installations in Government have microcomputers which have made a widespread penetration in the last five or ten years. The applications range from "Phase I" to "Phase II", with the former confined to applications such as payroll and accounts.

The Government computer centres face a personnel problem, as it is difficult to attract the right calibre of qualified and experienced staff into Government. Having recruited them, it is even harder to retain such staff.

b) Private Sector

Currently, there are about thirty vendors of computer equipment in Zimbabwe.

The private sector is heavily computerised, with most applications falling into the Phase II category. The private sector is, however, less susceptible to the personnel problems experienced by the public sector. It is probably true to say that most private sector installations are based on microcomputers. Estimates put the number of micros that have come into the country in the last five years at between 3500 and 4000 - a number that is almost certainly on the low side - as a sizeable number of micros are hand-carried into Zimbabwe.

Phase II applications such as computer-monitored manufacturing and CAD are available in Zimbabwe, though on a small scale.

C. TELECOMMUNICATIONS

Telecommunications are provided by a parastatal called the Posts and Telecommunications Corporation (PTC). The PTC provides reliable data networks within cities. Data links between cities are of good quality wherever they are accessible to microwave channels; but those are expensive. Dial-up links are cheaper but tend to be less reliable.

The PTC provides good quality telefax and telex services, although many companies prefer using fax as an economical alternative to voice and telex. With a view to providing better quality of data communications, the PTC recently inaugurated Zimbabwe's X-25 network - called "interim ZIMNET" - with a switching node in London. The "full ZIMNET" should be introduced in about two years.

The availability of data circuits country-wide has made it possible for banks to install country-wide computer networks. For example, CABS (Central African Building Society) has about 300 on-line terminals country-wide at all times, and about 700 devices including printers. Even branches in the rural areas are on-line.

D. SOFTWARE HOUSES

There are a number of companies that provide software services in Zimbabwe. Some of these may be small, one-person outfits. The larger companies provide both software and consultancy services. Some of the software houses have developed software which they are marketing internally and externally.

E. CONSULTANTS

A number of companies provide consultancy services ranging from programming to computer auditing. This area is led by the large multinational auditing companies such as Price Waterhouse, Arthur Young, Peal Norwick and Mitchell, etc. However, a number of younger consultancy companies are also available.

F. EDUCATION AND TRAINING

Although Zimbabwe is generally self-sufficient in its number of computer maintenance engineers, there is a shortage of manpower for managerial and business analyst positions.

A number of institutions provide training. The University of Zimbabwe offers composite degrees in Computer Science, plus one other subject, e.g. Economics, Business Administration, etc. While this approach may be a reasonable one for a developing country, the problem is that the University courses tend to be too theoretical, making lengthy and expensive training courses in applications necessary when the graduates later start working.

The Polytechnical Institutes offer courses leading to undergraduate diplomas. Graduates from these courses tend to be more practically oriented.

Both the University and the Polytechnics suffer from a lack of trained teachers or trainers and must recruit practitioners to teach part-time. The Polytechnics have even postponed the introduction of additional courses due to this problem.

There are many privately owned training institutions in Zimbabwe. Some of these are reputable and offer good value-for-money courses. Others tend to exploit the young unemployed by offering them courses which do not result in anything useful.

Computer education in schools is just beginning. The Government has yet to decide exactly how this should be done.

G. POLICY AND KEY ACTORS

The federal ministries expected to play major roles in the process of informatics policy formulation and implementation are:

a) Finance, Economic Planning and Development
b) Labour and Social Welfare
c) Industry and Technology
d) Trade and Commerce
e) Higher Education
f) Primary Education
g) Information, Posts and Telecommunications

H. THE COMPUTER IN ZIMBABWEAN SOCIETY

Although Zimbabwe has no integrated policy on informatics, it does have regulations, procedures or sectoral policies dealing with specific informatics issues. These will be presented below.

a) Centralization

The Government has followed a policy of centralisation of data processing within the public sector. In practice, this policy means that no ministry or department will be allowed to acquire its own computer hardware/software without authorisation from the Centralised

Department of Central Computing Services. This policy extends to the creation of informatics posts in ministries and departments. The Federal Service Commission consults the Department of Central Computing Services prior to authorising the creation of any informatics posts in the ministries or departments. Needless to say, there are many officials who find ways and means to circumvent these regulations.

b) Acquisition of Hardware and Software

The ultimate control in the acquisition of hardware and/or software rests with the Ministry of Trade and Commerce through the granting of foreign currency allocations. Any organisation intending to purchase computer technology has to apply to this Ministry for a foreign currency allocation. The allocations are granted in line with the prioritization of national development priorities. The Ministry of Trade and Commerce has an inter-ministerial committee which vets all applications. This committee examines the technical soundness of each application.

All applications for foreign currency allocations must follow a format laid down by the Ministry of Trade and Commerce. A considerable amount of detail has to be provided to establish a case for the allocation of foreign currency.

c) Telecommunications

The PTC has regulations which forbid the installation of data communications equipment on their circuits without their approval. The only exceptions are local area networks. In Zimbabwe, a local area network ceases to be such if it crosses a public thoroughfare. Devices such as modems and telefaxes have to be type-approved before they can be connected. Furthermore, no one is allowed to purchase modems independently - they can only be rented from the PTC.

d) Expatriates

The employment of expatriates is not encouraged by the Government. A work permit will only be granted to an expatriate if it can be established that there is no Zimbabwean capable of performing the indicated job. Work permits will only be granted if a Zimbabwean is identified/appointed to understudy the expatriate. On this basis, for example, it would be difficult for a non-Zimbabwean to get a work permit for a programming job.

I. INDUSTRIAL INFRASTRUCTURE

Zimbabwe has started Assembling microcomputers from semi- and completely-assembled kits. One company has been given the go-ahead to manufacture through-hole plated single layer printed circuit boards. One of the leading electronics companies has designed a modem, the prototype of which is currently being tested by the PTC. Black and white TV sets are assembled in the country; so are telephones and switchboards. The Government, through the Ministry of Industry and Technology, is encouraging the establishment of viable electronic industries in the country.

The country currently faces serious shortages of computer stationery, and moves are underway to establish local production. In the meantime, computer output to microfilm is being used in Government to deal with the paper shortage.

J. CONCLUSION

Zimbabwe reflects an encouraging heightened awareness of the usefulness of information technology as a tool for development. This does not mean, however, that the policy-makers are adequately sensitised to the potential of information as an organisational resource. A lot of work still needs to be done to make policy-makers aware of this. Currently there are no visible links between the informatics and information sciences sectors. Only a few joint workshops have been held with no real encouraging output. A number of ministries are attempting to draft some policy recommendations, but these tend to be regulatory rather than promotional.

NATIONAL INFORMATION AND INFORMATICS POLICIES IN AFRICA: REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

MALAWI: NATIONAL INFORMATION POLICY

S. Mwiyeriwa
University of Malawi Libraries

R. Masanjika
Malawi Polytechnic

CONTENTS

A. INTRODUCTION

B. ROLE OF THE NATIONAL RESEARCH COUNCIL

C. CONSULTANCY MISSIONS

D. POLICY INITIATIVES

E. INFORMATION LEGISLATION

  a) Development of information manpower
  b) Generation and collection of information resources
  c) Organization, storage and retrieval of information
  d) Effective access to and utilization of information
  e) Co-ordination of library and information services

F. INFORMATION INSTITUTIONS

G. LINKAGES WITH INFORMATICS POLICIES

H. ROLE OF PLANNERS/POLICY-MAKERS

I. FINANCING

  a) Domestic
  b) External

J. CONCLUSION

K. REFERENCES

A. INTRODUCTION

To the question: "Does Malawi have a national information / informatics policy?", the answer has to be "Yes" and "No". The ambivalent response is not an easy way out of a difficult query but an accurate rejoinder to a persistent problem. The rather hazy picture becomes clear as we examine Malawi's efforts at formulating a National Information Policy.

The formation of the Malawi Library Association (MALA) in 1976, and its inauguration a year later, ushered in a new consciousness among the small circle of professionals in the country. UNESCO [1] took the initiative, in 1974, to encourage member states to harmonize their documentation, library and archives services into one national information system (NATIS) capable of facilitating the process of socio-economic development. Following this initiative, the newly created Malawi Library Association held that the formation of one functional nation-wide information service would contribute to a lasting foundation for the country's development.

B. ROLE OF THE NATIONAL RESEARCH COUNCIL

The National Research Council in the Office of the President and Cabinet was identified as the competent organ of Government which possessed the instruments for piloting the country's disparate information resources on the path to a unified system. As early as March 1977, MALA submitted to the Council a document explaining the NATIS concept and its relevance to Malawi and asking the Council to co-ordinate all actions which may have to be taken to achieve the NATIS objectives. The Council, sitting at its 11th Meeting, concluded that the NATIS philosophy was worth pursuing and encouraged the creation of appropriate mechanisms to oversee its development.

A preliminary meeting was held on July 13th, 1978 which recommended the creation of a National Documentation and Information Committee, to comprise representatives from the Ministry of Agriculture, University of Malawi, the National Library Service, the National Archives of Malawi, the Malawi Bureau of Standards and the National Research Council.

C. CONSULTANCY MISSIONS

The second stage in the development of Malawi's information policy relates to surveys which may be wholly credited to neither the National Documentation Information Committee nor the Malawi Library Association, although both organizations were involved in the analysis of their findings. In the arena of information, the government saw the need for immediate action and it was felt that this could be implemented through a National Documentation Centre. The novelty of documentation centres in Southern Africa and the lack of finished examples to provide general guidance, lead to expert advice being sought from elsewhere.

In late 1980, under UNDP preparatory assistance, Mrs. Antoinette David of France and Mr. Stephen Massil of Britain carried out a combined feasibility study on the establishment of a National Documentation Centre. Mrs. David examined the information services and needs in the business, industrial and commercial fields, including intermediate and appropriate technology, and new and renewable energy. Mr. Massil focused on economic, social and political information. Under the same project preparation exercise, a UNESCO mission was conducted in 1979 by Mr. Michael Roper of the Public Record Office, London, on the establishment of a Central Microfilming Unit to be attached to the National Documentation Centre.

The three resultant reports offered some divergent recommendations and put forward for consideration some programme suggestions which seemed utopian. But there was a strand of agreement that Malawi was rich in documentary resources and needed a central co-ordinating agency to channel them and to help Malawians exploit information for development. All three reports discussed the problems of storage, retrieval and exchange of information which, in Malawi, were aggravated by the scattering of documents - especially in the country's commercial, academic and administrative centres.

Having extensively examined the three reports, Government officials agreed that:

a) A National Documentation Centre should be established within the framework of the National Documentation and Information System.

b) A Central Microfilming Unit should be created as an affiliate of the system, but be operated by the National Archives of Malawi because of the centrality and unique nature of Government records.

Fortunately for Malawi, the consultancy reports were not relegated to shelves in some dusty and overcrowded registry. A project document was culled from the recommendations and has been submitted to donors. At the time of writing, it would seem that UNDP is considering to help Malawi establish a National Documentation Centre and Central Microfilming Bureau.

If funds are secured it will be possible to launch a programme which can provide an information network for meeting the information needs of Government departments and ministries, statutory organizations and the private sector, while also paying special attention to the specific information needs of decision-makers, the agricultural sector and industry. In addition, the introduction of micro-photographic services will facilitate resource-sharing and document preservation.

D. POLICY INITIATIVES

The third stage in Malawi's information development is perhaps the most dramatic as it pertains to efforts which address the policy problem itself. In March 1987, the Documentation and Information Services Committee organized a Seminar on "National Policy on Library and Information Services" under UNESCO sponsorship and with the collaboration of the Malawi National Library Service. Although the Committee had met several times in the past to discuss NATIS-related issues, this was the first time a major seminar had focused on development of an official policy to guide implementation of a National Documentation Centre.

The objectives of the seminar were three-fold:

a) To draw the attention of government to the need for a National Policy on Library, Documentation and Information Services in Malawi.

b) To sensitize all agencies in Malawi involved in or concerned with the collection, processing, dissemination and use of documentary information, about the need for a National Policy as the basis for planning and effective co-ordination of information activities, and assign the responsibilities for ensuring the provision of information services.

c) To lay the foundation and initiate the procedures for the formulation of a National Policy [2].

The Seminar resolved that the main goal of Malawi's National Policy should be the achievement of optimal utilization of the information and professional knowledge generated and available in the country or abroad as a planning, decision-making and problem-solving resource.

For purposes of easy implementation by the Government five elements of the National Policy were articulated as follows:

a) Development of Information Manpower

It shall be government policy to promote and support the training of information workers of all categories (Librarians, Archivists and Documentalists) to meet the country's manpower needs, and to give appropriate professional status, recognition, incentives and professional development opportunities for the effective management of the country's library and information services.

b) Generation and Collection of Information Resources

It shall be government policy to strengthen the generation of indigenous information and publishing activities through widening the number, range, types, coverage, and by better quality of information materials, and by intensifying the collection of information available locally and abroad.

c) Organization, storage and retrieval of information

It shall be government policy to provide a full range of information services and information and documentation delivery mechanisms appropriate to different user groups, promote efficient methods of resource management and stimulate optimal utilization of emerging information technologies to ensure that information services are cost effective.

d) Effective access to and utilization of information

It shall be government policy to ensure that people of all categories and in all localities have easy access to a wide range of information sources through the development of information networks, resource-sharing programmes, and the perception of users regarding the value and utility of information and its application to planning, decision-making and problem solving processes.

e) Co-ordination of library and information services

It shall be government policy to evolve a national co-ordinating mechanism to ensure effective and optimal implementation of the national policy on libraries and information services, projects and programmes in the country, in order to avoid unnecessary duplication of effort and avoid waste of resources in the national information system development and operation.

The Policy Document has now been submitted to the National Research Council for official endorsement by Government.

E. INFORMATION LEGISLATION

The past decade has seen a flurry of activity in legislative reform.

The old National Archives Act was abolished and a new one promulgated in 1976, giving wider powers to the Government Archivist in the collection and protection of public archives, modern records and historical manuscripts. The National Archives of Malawi is also the country's only legal deposit library. A couple of years ago, consideration was given to revising or repealing the Printed Publications Act of 1947. A new draft law has been submitted to the Government and, when enacted later this year, it will close all loopholes in the old legislation and allow for the extension of legal deposit to new literary forms and media as they are produced. It will also permit the University Library System and the National Library Service to enjoy legal deposit so that as many readers as possible are exposed to the nation's literature.

The present Copyright Act with its 18 meagre sections has serious shortcomings, among which is the lack of a designated responsible Minister. Nor does it recognize the various forms of artistic endeavour and the importance of rights as understood by both UNESCO and the World Intellectual Property Organization (WIPO). Here, too, a Copyright Committee was created at the instigation of the Malawi National Commission for UNESCO sponsored National Workshop on Copyright, which was held in Zomba from April 1-4, 1985. A new mammoth Act, with 51 comprehensive sections dealing with the protection of publications, performing and artistic arts, broadcasts and expressions of folklore, is in the making.

The National Library Service Act was passed by parliament in 1967 and it carried a provision for a National Library Service Board with powers to "promote, establish, equip, maintain and develop Libraries in Malawi" [3]. From the phenomenal growth of public library services in Malawi, it would seem that the provisions of the Act are adequate for Malawi's needs.

F. INFORMATION INSTITUTIONS

The Ministry of Education and Culture is responsible for the development of the Government and Statutory organizations which run library and information services: the National Library Service, the University of Malawi, the National Archives of Malawi and, of course, the many schools and colleges scattered throughout Malawi. Other Ministries are responsible for their own libraries/information units, e.g., the Ministries of Agriculture, Health, Forestry and Natural Resources, Office of the President and Cabinet, to mention only a few.

The large libraries are well stocked and staffed but in the stiff competition for funds, small departmental information units suffer from under-staffing and poor budgetary allocation. In their totality, however, they play meaningful roles defined for them by the needs of their constituents. Much credit is owed to the Malawi Library Association for:

a) Uniting all persons and organizations engaged in library, archives, documentation and information work in the country.

b) Establishing, as early as 1979, an annual training programme leading to the award of the Malawi Library Assistants Certificate.

Some co-ordination is done on an ad hoc basis by the National Documentation and Information Committee, but the Committee's contribution will be felt when it receives added powers and responsibility within the National Policy framework.

G. LINKAGES WITH INFORMATICS POLICIES

Informatics is a new field in Malawi and its development depends on the initiative of management in specific institutions. This, in turn, depends on appropriate support from their parent organizations. For the sake of standardization, it is possible that a unified information and informatics policy will be formulated in the near future. The only fear is that this might not happen quickly enough, as change in the informatics environment is so dramatic and fast.

H. ROLE OF PLANNERS AND POLICY-MAKERS

Planners and decision-makers are not averse to the formulation of a national Information Policy. One may call attention again to the developments cited in the first section of this paper, coupled by the several workshops and seminars which have been organized at the highest official level. The Government has gone to some length in re-defining and revising appropriate legislation.

I. FINANCING

a) Domestic

Libraries and information services throughout the world enjoy support that is usually characterized as poor to fair. In Third World countries, such services have to fight for a place on the Governments' priority listing and they tend to lose because of their inability to generate income or because of the intensity of other projects in Health, Agriculture, etc.

In Malawi, however, it has been found out that funding increases according to the degree that responsible officers have been educated to recognise the need and importance of such services. And it behooves every librarian and information scientist to wage an unrelentless battle to convince his/her authorities of the vitality and indispensability of information in the development of citizens and national institutions.

b) External

The important role played by foreign aid in creating conditions amidst which NATIS seems possible has been mentioned already. So too has the inordinate length of time covered by the three major steps in policy development. The main task lies ahead, and Malawi will be grateful for external assistance in the form of human resources or funding for the following projects:

i. National Workshop on Informatics Policy - to discuss the nature of the problem, to define the policy in the context of a unified national information/informatics policy.

ii. Survey of information needs of Malawians and of the manpower requirement and training needs of the existing information resources.

iii. Compilation of a Union List of Periodicals - to act as a major tool for resource-sharing.

iv. Launching the National Documentation Centre and the Central Microfilming Bureau - experts to launch these services and train counterpart staff and technicians in operating them.

v. Funding to correct weaknesses in collection development and to strengthen existing institutions e.g., building specialist collections, acquiring reprographic equipment and stationery, media and computer hardware and library software for the key institutions in the country.

J. CONCLUSION

To the extent that individual legislative frameworks, supported by funding and staffing, exist in Malawi, one could argue that information policies exist. These pieces of legislation have made it possible for institutions such as the National Library Service, the University, the Ministry of Agriculture, the Malawi Bureau of Standards and others to offer meaningful information services to their patrons. Malawi's present policy is therefore the sum total of policies of the various institutions who try to do something on their own, within the limits of the available parental support.

But the real national policy which will provide for systematic and centralized direction in the context of this Seminar remains to be ratified by the Government. This target is in sight of realization.

K. REFERENCES

1. UNESCO NATIS: National Information Systems: Objectives for National and International Action. Paris: UNESCO, 1975. 30 p.

2. MWIYERIWA, S. S. (ed.) Seminar on National Policy on Library and Information Services. Lilongwe, 1987. p.2.

3. NGAUNJE, M.A. The National Library Services. In Libraries in Malawi: a textbook for students. Edited by Mary Casteleyn. Zomba: Malawi Library Association, 1985. p.6.

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

POLICY-MAKERS' AND PLANNERS' VIEWS ON INFORMATION/INFORMATICS POLICY IN TANZANIA

N. Mlolwa

D. Sawe

Ministry of Finance,
Economic Affairs and Planning

CONTENTS

A. INFORMATION AND POLICY IN TANZANIA

- a) History of Planning in Tanzania
- b) Information Resource Constraints
    - i. Resource Limitations
    - ii. Immediate Priorities
    - iii. Current Trends
        - a. Economic Factors
        - b. Technological Factors
    - iv. Projections
- c) Priorities
- d) Ingredients for a Successful Information Policy
    - i. Personnel
    - ii. Information Types
    - iii. Passive Information
    - iv. Active Information
        - a. Information In Planning
        - b. Information In Implementation
        - c. Information In Decision-Making Hierarchy
        - d. Monitoring Active Information Requirements
- e) Information Policy
    - i. Policy Benefits
    - ii. Key Sectors
    - iii. Resources
    - iv. Institution-Building
    - v. Sectorial Priority
    - vi. Sustainability

B. INFORMATICS AND POLICY IN TANZANIA

- a) Historical Positions in Informatics
    - i. Official Positions
    - ii. Perspective

b) Informatics Policy Requirements

   i. Resource Allocation
   ii. Evolution
   iii. Future

c) Telecommunications and Informatics

   i. The Present
   ii. Foreseeable Future
   iii. Financing

d) Towards a National Information Policy: Seminar On: "The Contribution of Informatics To Economic Development"

   i. Background
   ii. Objectives
   iii. Participation
   iv. Presentation
   v. Recommendation
   vi. Results

e) Developments in Support of National Informatics Policy

   i. Re-Organization Of The National Planning Authority
   ii. The Key Actors
   iii. Policy Formulation
   iv. Policy Implication
   v. Policy Objectives

f) Unifying National Information and Informatics Policy

g) Contribution of International Institutions

A. INFORMATION AND POLICY IN TANZANIA

a) History of Planning in Tanzania

Tanzania's public investment in economic development has been centrally co-ordinated since as far back as 1929, with the Planning Agency of the Colonial Development Act, after "German East Africa" had become "Tanganyika" under a League of Nations Mandate to Great Britain. Although the emphasis on methodology of development planning has changed considerably since that time, the actual process of centralized planning is not a recent feature in the national economy.

Before independence in 1961, development planning evolved through various stages during which the emphasis was on developing Tanganyika as a peripheral economy to support the British Isles. Among the highlights were: the Central Planning Committee (1937); the Colonial Development Welfare Act (1940); the Post-War Planning Committee (1944); the Planning Committee for Ten Year Development Plan (1946-1956); the Development Organization of the Development Works Department (1949); and the Cabinet Development Committee (1960). From 1960 until independence day, the role of the Cabinet Development Committee was to advise the governor on matters concerning development planning. The progression of these institutional arrangements shows how the authority of planners progressively increased over the pre-independence years.

Immediately after independence, the Government created a Commission for Economic Development to replace the Cabinet Development Committee, and a Ministry of Economic Planning as the Secretariat of the Commission. Following a process of restructuring, during which time Tanzania's main planning unit was variously based at the President's Office, at the Treasury, and as an independent institution, the national planning authority is now the Ministry of Finance, Economic Affairs and Planning. However, in the near future, a further restructuring is due to create an independent planning Commission chaired either by the President, or the Prime Minister; this new Planning Commission is currently under study.

Pre-independence planning was for a peripheral capitalist economy, whereas current planning is for an independent African-socialist economy. But the importance of appropriate information as a requisite of effective socio-economic planning remains an underlining theme to all development efforts since 1929. On a more specific level, to support information services the government has made legislative and financial commitments resulting in research and documentation centres, national library services, literacy programmes, mass-media campaigns, etc., as well as approving libraries and other related initiatives from the international community. These actions reflect a continuous renewed tradition of awareness among policy-makers and planners, of the contribution of quality of information for the development of a socio-economic infrastructure.

b) Information Resource Constraints

i. Resource Limitations

Recognizing constraints in skilled labour and financial resources, problems facing the country's information-services can be attributed to the cost of making existing institutions and methods for processing and preserving information more effective, rather than solving a lack of awareness. Even an optimal allocation of resources to satisfy information services alone, could not come close to addressing the full scope of overall requirements.

ii. Immediate Priorities

In the context of the wide range of more direct national priorities (e.g., food self-sufficiency, war against Idi Amin, the immediate need for teachers, medical staff, etc.), it is improbable that any hypothetically optimal resource allocation to information services can assure progress to the overall national welfare. In other words, the best information services are of little value to persons unable to fulfil the basic needs of daily existence and have the occasion to access that information; in such a case, the society could split into information haves and information have-nots.

iii. Current Trends

Thus, although the contribution of information to development is understood, economic realities of the Third World have prevented its value for being perceived as a priority area for public investments. However, this perception has recently begun to change, due mainly to two key factors: the first economic, and the second, technological.

a. Economic Factors

Firstly, Tanzania's economic problems are showing signs of alleviation. There is an increasing broader availability of skilled human resources to work with upcoming investable financial resources. Information handling, in all of its forms, may be expected to benefit from these trends. For example, the National Census of 1968 was conducted with school children as enumerators and most of the information was electronically processed abroad; but in the Census of 1988, despite the increased population and its wider dispersion, enumerators were school teachers and most, if not all, the electronic data processing is to be done in Tanzania. The national labour base now permits this.

b. Technological Factors

The second factor is that the technology for information service has at the same time become more powerful, efficient and, especially, cost effective. Therefore, information handling technology grew more accessible to the expanding requirements of information-users in a developing country. Thus, an increased supply of the tools for information access and processing is bringing about an increased demand both for the information and for technology to access that information.

iv. Projections

From the twin factors of growth in the local resource-base and of technological development in electronic data processing, the improvement of information services in Tanzania shall gain significance and priority. Additionally, from the combination of these two factors, various synergies can be expected. Improved storage and retrieval of data, with the availability of man-hours in a larger spectrum of deeper analytical skills, permit the existing information to be used more exhaustively while being better updated, developed and disseminated. Whether one looks at the government budget or the budget of the individual procedures and consumers, these results will enhance planning and decision-making on national resources.

c) Priorities

Already now, the degree of priority attached to information pursuits is high and still growing. This is evidenced to some extent by a rapid increase in the growth rate of computer acquisitions, over the last five years, used by both the public and private sectors. At the same time, this is also a necessity due to the increasing complexity of planning and financing for a growing population. Thus, inside the Government services, many more computer-oriented courses are being financed and an increasing amount of work is being at least computer-assisted if not entirely computerized. Institutions such as Treasury Computer Services are facing more competition in the supply of computer services and yet, despite continuously upgrading equipment and staff, such institutions can barely keep pace with the rate of growth of their own workloads.

Such a demand for information resources can not be met by public financing alone; in many cases already, the international community provides direct assistance in the form of equipment and published materials for public services. Thus, resource mobilization within Tanzania is at present essentially in the forms of training new manpower and using the existing specialists as intensively as possible.

This, however, is recognized as being an interim solution. More concrete efforts are in preparation, at University and Technical College levels, to improve instruction of librarianship, computer-science and application of computers to other subject areas. But here again, the issues concerning resource limitation are also a problem. There is a sacrifice made when allocating specialists towards teaching while they are in demand for other operational services elsewhere; it is then necessary to encourage the professionals to diversify their activities. And hopefully, the brain-drain phenomenon may be reduced by thus increasing their possible sources of remuneration.

d) Ingredients for a Successful Information Policy

i. Personnel

For a national information policy to succeed, the labour base is an essential ingredient - especially in terms of trained personnel. In this context, possible roles for institutions under public, private and international ownership must be identified and analyzed to determine what each can best contribute towards the policy's manpower requirements. And, in view of the multi-sectoral nature of information in general, the policy's basis and perspective must be multi-sectoral to cover different fields of activity wherein information circulates.

ii. Information Types

Further, a self-sustaining national information policy must not be restricted to "preserved information" services, but should take into account the more immediate need for real-time capturing of and processing of "live information". This is where the greatest benefits for planning and policy-making will be obtained: for strategic and tactical decision-making and monitoring, and for day-to-day requirements of operational management. But the rather tentative distinction that can be drawn between preserved and live, or passive and active information, must be taken into account within the policy itself as well as during its preparation. In one case, there is the issue of building and maintaining a stock of data for eventual use; in the other case there is the issue of improving a flow of data for immediate requirements. Added to the two cases is the advent of transborder data flows in which the problems and benefits of both types of information are rendered more acute on an international scale.

iii. Passive Information

The relatively slow rate of progress in libraries, archives and documentary services is due mainly to the lower requirements for passive information on current activities in decision-making within environments of tight resource limitations. A limit on resources means that less funds can be allocated towards stock piling and preserving information. Meanwhile, day-to-day decision-making requires information for monitoring on-going activities to a greater extent than the information from libraries and documentation centres; therefore, the passive information kept therein is not frequently accessed. However, as economic activities make progress and the industrial capacity utilization grows out of the all-time low of the early 1980's, economic planning shall also begin to include a more innovative and expansionary outlook. It is then that the demand and supply of passive information services might be expected to develop a higher priority.

iv. Active Information

Economic planners and statisticians have a leading role in determining both the supply and the demand of active information for economic decision-making. Next, education by its nature is a leading sector for co-ordinating national information services. However, in developing countries the requirements of other sectors do not always correspond to the educational system's overall priorities. This contrasts with industrialized countries wherein one finds research contracted by firms to educational institutions, while the same firm also operate research centres. Public and private information services in the Third World cannot be as well-equipped and stocked as counterparts in industrialized countries, and are, thus, not as responsive to the needs of information consumers. Further, information consumers have a lower propensity to invest in research and therefore a relatively lower demand for passive information as opposed to the active information in daily use. However, the active information of the moment eventually constitutes the archives preserved in the future. Thus, on the one hand, the significance of research and development budgeting is not unrelated to the relative economic prosperity of its environment and, on the other hand, the priority of passive information relates to the most immediate requirements; so it is important to build and nurture a foundation for the future by preserving the flow of current information.

a. Information in Planning

Information required in planning reflects the need to take into account resource access and constraints facing individual activities, and alternatives to attainment of previously established goals. On another level is the definition of realistic goals towards which subsequent activities shall be planned. In Tanzania, the planning process goes further. After the goals are established in broad terms by the policy-makers they are refined by the planners. Then, the implementers individually submit projects for consideration, stating resources already obtained or committed, and the amount requested from government for the project's duration. These projects are then studied and available funds are allocated on a sectoral basis to the projects. The standard problem is that total project submissions always exceed the government's available funds; this necessitates compromise.

b. Information in Implementation

As a result of project planning, information requirements during project implementation reflect the need for operational control and for monitoring the project's performance with respect to the planned targets. Here, technical knowledge of engineering, financial control, and other activity-specific aspects of the project shall be involved, always being derived from the project-planning stage. Thus in a situation of resource limitations, the quality of information service is of greatest relevance to the outcome of the work of planners and policy-makers in terms of efficiency and effectiveness in implementing projects, plans, or policies. By not being sector specific, planners and policy-makers as a whole are thus in a position to appreciate the multi-sectoral significance of information services to implementers, and the cumulative influence that information quality has on overall socio-economic infrastructure.

c. Information in the Decision-Making Hierarchy

The superior levels of a decision-making hierarchy seek to improve the ability to distil and analyze information from incoming data, and to transmit requests and directives with minimal response-times during which existing information could become obsolete. The grass-roots of hierarchy seek to improve the ability to respond to directives and ad hoc requests, and to facilitate the collection, compilation, interpretation and distribution of raw data inflows and outflows of packaged information. Then, at intermediate levels of the hierarchy, the channelling of information always need to be faster, smoother and less subjected to manual re-organization or transcription. Consequently, at a preliminary stage, informatics integration should be directed towards respecting rather than changing the existing structure of information flows, and particularly so where the introduction of informatics occurs simultaneously at differing levels of a decision-making hierarchy.

d. Monitoring Active Information Requirements

As a corollary, the preservation of information requires a storage that facilitates the retrieval and cross-referencing of specific data elements from available stock. There is always a problem of monitoring the information itself, rather than the focal point of the activity causing the information to flow. Unless some form of Management Information System (MIS) is built into the procedures, this could be a difficult assessment. Thus, the requirements of statisticians in terms of monitoring and measuring activities, while being tied to the needs of planners and decision-makers, also determine the production and preservation of information concerning current activities.

e) Information Policy

i. Policy Benefits

The creation of an information policy, which provides a declaration of intent and a broad set of multi-sectoral priorities, may be considered productive. Specialization, as a fact of life in information management, would thereby be assisted while respecting areas of comparative advantages among sectors. At the same time, the co-ordinated approach enabled by a policy statement would reduce the effects of grey areas in which occur either duplication of efforts, or competition and conflict, or neglect. In this manner, financial flows can be channelled and monitored according to overall criteria, as well as according to the individual criteria of the sectors and specializations. In Tanzania, tangible success has been achieved by doing this for the agricultural and medical fields. There is still much more that can be done particularly by means of bringing together individual achievements, by making them more accessible to the general public, and by enhancing their performance.

ii. Key Sectors

In the future, the finance and communications sectors are expected to gain dominance as vectors for the improvement of information services. These two sectors are infrastructural to the economy's information network. Through them, the management, development and use of all forms of economic resources can be enhanced. Moreover, the two sectors influence not only the individual behaviour of public agencies, private firms and households, but they also contribute to socio-economic welfare in terms of national security, self-sufficiency, international marketing capability, domestic trade flows, and many other areas. It is said that information is power; the backbone of power is to be able to use it effectively, and these two sectors determine the general ability to produce, to obtain and to use information. The growth of the sectors of finance and communications, within the context of general economic progress, shall therefore enable improvements in the overall availability of information.

iii. Resources

A policy statement would have to take into account the main vectors for its sustenance, and to prepare the way for building up a resource base, particularly in manpower. In this case, the usual manpower problems of developing countries are compounded by the need for polyvalent specialists to manage the information services, extended into the economic sectors and professional specializations. Librarianship is a skill, but is insufficient unless the information being handled is also understood by the librarians; otherwise, the procurement and classification of texts, and the provision of search-assistance to users are not possible. Therefore, the development of librarianship capabilities should precede the procurement of equipment and materials.

iv. Institution Building

For its own sustainability during implementation, an information policy needs to define institutional responsibilities. Decisions must be made on whether to change, adapt or retain the pre-existing institutional structures. Attention must be given to manpower for operating the institutions. Thus there may be a trade-off in sequencing the relative priorities of manpower development and institution building. Priorities of information types, whether active or passive, should be analyzed to define sequencing; it is also necessary to consider the existing institutions in the perspective of dominant requirements and foreseeable trends.

Cases may be expected to occur wherein priority and institutional self-sufficiency diverge. These must be pragmatically handled by either adapting the institution, or by postponing its creation, or by creating ways of integrating the priority elsewhere; but the demand and supply of these services need to be evaluated to approach a coinciding level.

A case in point is the delivery of information services into rural areas where the construction of libraries is not feasible. The solution is not merely an issue of delivering materials to the rural population, since it may be more effective to assist the population to periodically access materials already existing elsewhere.

v. Sectoral Priority

In Tanzania, the greatest volume of available information concerns agriculture and rural development. However, the sectors of industrial development, communications, financial institutions, mining, tourism, transport and storage are significant growth sectors. Most of these others are better placed than agriculture to absorb, integrate and sustain high technologies, to train personnel and to generally expand the market of information products and services. Therefore, any policy concerning national information services will have to take into account the future growth of these other sectors as well as their current relative proportions and contributions to the national economy. Another area to consider involves the existence of various types of enterprise-ownership within each sector.

vi. Sustainability

The types of information and their respective requirements are variable between sectors and between projects. The determination of relative priorities at the level of individual projects would probably be left to the implementers when they balance strategic and tactical requirements. At the sectoral level, the national planning authority has the role of determining priorities. However, in view of the resource limitations, it would be unadvisable to entirely subordinate the chances of success of resource allocations to following preset, and possible revisable, overall priorities. A short-term gain in a low-priority sector may enable an improved long-term approach to high-priority sectors, and a policy statement could establish a new understanding of relative sectoral priorities and needs for channelling resources. But a question of sustainability versus priority would still remain and require a pragmatic assessment in specific instances where the trade-off is perceived, either within or between sectors.

B. INFORMATICS AND POLICY IN TANZANIA

a) Historical Positions in Informatics

i. Official Positions

In Tanzania, the official position towards informatics is in a transitional phase. The importation of electronic data processing equipment is prohibited except with the authorization of the Minister of Finance, who must be satisfied that the conditions of acquisition meet a set of published guidelines. As discussed in the second part of this paper, this position from 1974 is widely recognized as being due for updating.

ii. Perspective

Coming from before the advent of the "microprocessor revolution", the current official position was reached at a time when it was more economical to expand the capabilities of existing computer units to serve new users than to acquire additional units, given limited resources in personnel and foreign exchange resources. Moreover, the labour requirements of computer systems in the early 1970's, when fewer training facilities were available, were considerably more specialized and delineated than at present. For the hardware to be effectively utilized, additional hardware imports would have involved either an increased turnover in the employment of few national specialists or the costly attraction of these from other countries. Furthermore, the necessary supportive infrastructures in the social and economic subsectors were not available to accommodate the requirements of the technological evolution. At the time, the supplies of energy, food, water, housing and socio-economic services were more urgent priorities than the relatively slight overall efficiency gain that the computers of the early seventies could offer to the Tanzanian economy.

b) Informatics Policy Requirements

i. Resource Allocations

On the whole, the introduction of information technology into an economy provides increased options towards long-term solutions for many macroeconomic problems. This also, however, requires the re-allocation of considerable financial resources without offering immediate compensation for other short-term problems also in need of substantial resource allocations. Given the plurality of ensuing socio-economic issues then raised, a concerted action at national and international levels for the developing of infrastructures to support information resources, appears to be the most desirable option for achieving positive and sustainable results. However, prior to any such action, decision-making in this direction needs to be based on a general acknowledgement of the nature of macroeconomic implications, and of the likely consequences of inaction for the individual country. During the mid-1970's, given the information technologies and the economic crises concerning Tanzania, the country was not yet able to allocate resources to even investigate such matters.

ii. Evolution

Now, the situation has visibly begun to change. The current unofficial position leans towards a cautious encouragement of informatics. Supporting this since 1983 is an explosive growth rate in the number of micro, mini and mainframe computers entering into the country. No specific restrictions are currently being enforced. The importation of each computer system is only registered at the Treasury. The prevalent attitude among those concerned emphasizes improving the quality of information-handling and data-processing wherever possible. Furthermore, in 1985 the Government's National Science and Technology Policy stated that information systems and technologies "shall be recognized as vital tools and components in strengthening the nation's scientific and technological capability" [Paragraph 82]. Implementation of this policy is proceeding with the development of institutions, particularly the National Commission for Science and Technology whose role shall be to advise the President on these issues.

iii. Future

Meanwhile, there is an acknowledged need for aligning the official and unofficial positions, to enable the adjustment of fiscal definitions and legislative provisions concerning information/telecommunications technologies and transborder data flows. It is also important, if only for the planning of training facilities, that the compilation of statistics on the types, capabilities and locations of existing computers and on the characteristics of their users, should be institutionalized. Furthermore, by not keeping abreast of the international evolution of legislation concerning transborder data flows, Tanzania risks becoming a haven for illegal data-processing activities.

c) Telecommunications and Informatics

i. The Present

The development of telecommunications in Tanzania is taking account of modern information transfer systems. The Tanzania Posts and Telecommunications Corporation is currently computerizing internal management and operations monitoring systems; installing digital data-switching capability to replace manual devices; increasing its number of microwave earth stations; broadening the distribution of telex and facsimile services; and upgrading its network circuits from voice-grade to data-grade qualities.

ii. Foreseeable Future

In the near future an electronic mail service is due to be commissioned. This would be the first stage for internal communications within the postal institution, especially for postal/money orders. Later, expansion of the service to the public is envisaged, particularly in view of on-going computerization schemes by the country's banks requiring such services for the reconciliation of accounts between banks and branches across the country. However, there are relatively few subscribers for the high speed data-switching facilities already in existence, and even fewer for the international network circuits. In this area, the development of internal trade and increased economic co-ordination with neighbouring countries are factors expected to favourably influence the capacity utilization level.

iii. Financing

In view of the recent economic problems and the restricted planning environment of the Economic Recovery Programme (1985/86-1988/89), financial allocations from Government have been mainly towards upgrading, using and maintaining existing systems, while acquisitions have mainly been sponsored by the international community. However, in the context of the increased number of units, Government allocations and expenditures for the use of computer services and for training have been growing continuously. The Government has also approved the above-mentioned computer projects of public enterprises.

d) Towards a National Information Policy: Seminar on: "The Contribution of Informatics to Economic Development"

i. Background

The creation of a national informatics policy was considered necessary by a well-attended seminar, held in August 1987, of top ranking national civil servants and invitees from SADCC states. The "Seminar on the Contribution of Informatics to Economic Development", unique of its type in Tanzania, was hosted by the Ministry of Finance, Economic Affairs and Planning. It was opened by the Minister of State, and closed by the Minister of State for Foreign Affairs. Co-sponsors included the University of Dar-es-Salaam, the Intergovernmental Bureau for Informatics of the United Nations Organization, and the UNESCO Regional Office for Science and Technology in Africa.

ii. Objectives

The Seminar was the culmination of efforts dating from five years earlier when the Minister of State at the President's Office challenged the University to take the lead in developing applications of information technology in Tanzania. Consequently, the University approached the Ministry of Finance, Economic Affairs and Planning, requesting it to host a seminar aimed at sensitizing the awareness of policy-makers and of the public at large on the significance of informatics. After consultations, the following specific objectives were set out:

(a) To provide an insight on the uses and applications of informatics for development,

(b) To accord the participants the opportunity to acquaint themselves with current developments in information technology, in particular its uses and applications in the key production and service sectors of the economy, and to show how informatics could help in promoting agriculture, education, healthcare delivery, public administration and industrial development.

(c) To facilitate an understanding of the social impact of informatics, its consequences and of the need for formulation of national strategies and policies for informatics.

(d) To make specific recommendations on the effective utilization of informatics activities in the country, in view of the presented papers and the ensuing discussions,

iii. Participation

The Seminar was attended by the Principal Secretaries of the Tanzania Government, Chief Executives from selected Parastatal and Mass Organizations and foreign delegates. Invitations had been extended to Principal Secretaries in the Ministries of Finance of the Southern African Development Co-ordination Conference (SADCC) countries; to the Executive Secretary of SADCC; and to representatives from Cameroon, Kenya and Nigeria. To this effect, two delegates from Swaziland and one delegate from Mozambique attended the Seminar. The Director General of the Intergovernmental Bureau for Informatics (IBI), who was a guest of the Ministry of Finance, Economic Affairs and Planning, attended the Seminar with five staff consultants.

iv. Presentation

During the Seminar, ten papers were presented by resource persons drawn from Tanzania, Ghana and IBI. The following themes were covered by the papers and subsequent discussions:

(a) International Informatics Experience.
(b) Informatics Experience in Tanzania.
(c) Informatics in Social Development.
(d) Informatics in Economic Development.
(e) IBI Experience with Informatics in the Third World.

v. Recommendations

The participants recorded twenty-one observations and issued six recommendations, which are summarized below:

(a) that a Task Force on informatics be formed;
(b) that measures be taken to ensure appropriate training in informatics;
(c) that existing restrictions on the importation of computers and computer-related equipment be revised;
(d) that Tanzania should make a timely entry in the informatics race;
(e) that regional, bilateral and international co-operation in the field of informatics should be pursued; and
(f) that Tanzania should consider becoming a member of the IBI.

vi. Results

Soon after the Seminar, the Minister of Finance, Economic Affairs and Planning set up a Task Force with eight members. These were drawn from the Ministry's National Economic Policy Division (the Task Force's Chairman) and its Treasury Computer Services Directorate; the University of Dar-es-Salaam (the Vice-Chairman); the Ministry of Agriculture and Livestock Development; the Ministry of Communications and Works; the Ministry of Education; the National Scientific Research Council; and the Tanzania Posts and Telecommunications Corporation. A report prepared for the Minister in March 1988 is currently being processed. It contains recommendations agreeing in essence to those of the Seminar, but with an added emphasis on the institutional framework for co-ordinating national informatics activities.

e) Developments in Support of National Informatics Policy

i. Re-Organization Of The National Planning Authority

The institutional emphasis of the Task Force on Informatics coincided with a Parliamentary debate on restructuring the Ministry of Finance, Economic Affairs and Planning to create an independent Presidential Commission for economic affairs and planning. By separating economic planning and monitoring from the actual implementation of economic activities in the Government mechanisms, it is not unlikely that the development of an institutional framework for the planning of national informatics development shall result either from the creation or from the eventual activities of this new Commission. This would improve the current situation whereby informatics policy work is shared among several departments in the current Ministry.

ii. The Key Actors

Key actors in the national informatics policy would therefore be statisticians and economists, i.e., the main professional categories at the Economic Affairs and Planning Department of the present Ministry of Finance, Economic Affairs and Planning. Currently, this Department is innovative in applying computers to assist work routines. In a broad sense, planning and policy-making in Tanzania is essentially based on the work of statisticians and economists who have an immediate need for information in terms of the collection, analysis and projection of flows of active data.

iii. Policy Formulation

From these key actors, management decision-making and operational monitoring are natural growth-paths for vertical integration, just as inter-sectoral communications and multi-sectoral networking are for horizontal integration. This occurs through the leading role of planners and policy-makers in their information requirements, which determine the scope of data collection and analysis. In policy formulation, given such a scenario, emphasis must then be placed on improving the quality of existing data flows for permitting decision-makers to receive timely, concise, precise and complete information concerning the socio-economic environments with which they are dealing, and to enhance the efficiency with which their directives are carried out.

iv. Policy Implementation

In fact, informatics implementation is currently operating with the statistical and planning offices. The contribution of educational institutions and technical professions, however, is severely lacking. The gap in manpower resources is already being lessened by the private sector's recent proliferation of short and long courses on various aspects of applying and managing information technology. It is encouraging to note that the public sector is responding in this respect by sponsoring an increasing number of employees to attend these courses, while tailoring syllabuses to suit specific requirements.

v. Policy Objectives

The electronic processing of information could be greatly facilitated by integration with electronic data-capture and transmission systems. As the base of national informatics broadens in terms of geography and of professions, technical infrastructures, capital expenditures and manpower availability that are not yet obtainable on a suitable scale will be required. However, an informatics policy starting in the late eighties will have to take this option into account, given the banalization of portable computers and the immediate need for such services, if only to minimize the manual processing of information. In other words, failure to act in this direction could imply that the technology shall be inefficiently used by producing GIGO (i.e., Garbage-In-Garbage-Out) from its raw data inputs.

f) Unifying National Information and Informatics Policy

A unification of national information and informatics policies is desirable by being far-reaching, by facilitating public access to documentation services in national and international centres, and by producing progress cutting across sectoral boundaries. For example, a farmer can use access to data on agricultural research and technologies as well as on the agri-food industry's requirements; manufacturers can communicate with suppliers and customers at different locations; rural medical officers can have access to the national stock of pharmaceuticals. Such examples are practically endless. In contrast, the main national source for public information is the mass media, especially radio services for the rural majority. The necessity for unifying information and informatics policies is becoming increasingly stronger in that survival in international trade now depends on access to the technology providing information on international markets, research centres and other data banks. Of these, the international data banks can provide basic information for initiating research on procurements and marketing.

The feasibility of unifying information and informatics policies exists, but the key is how to set the best foundation for uniting two different fields. After all, informatics is a relatively new phenomenon, while information services are well established. Other than the feasibility, the sustainability of policy measures must be addressed while bearing in mind that the changing nature of documentation and information technology requires that flexibility be incorporated to allow adjustment of the policy for future conditions.

g) Contribution of International Institutions

It is notable that the inroads of computer technology into general information services are quite considerable. These can include: computer-controlled library access, documentation held on electromagnetic media, CD-ROMs, microfiche, computer-based research and development, international data bases accessed through international organizations such as FAO, IBI, UNESCO, etc. Added to these services is the importance for Third World countries to keep pace with international data and communications standards - a task where the contribution of international institutions is becoming increasingly more significant.

Hitherto, international and regional organizations have had an important role in assisting the exposure and awareness of developing countries to technological developments which occur in industrialized countries. Furthermore, their assistance has also provided the industrialized countries with exposure to, and awareness of, the intrinsic socio-economic problems of the Third World.

The continuation of this two-way interface role among countries, especially between the rich and poor countries, together with the contribution of trained and experienced personnel to assist the improvement of socio-economic services in developing countries, is of an inestimable value towards furthering world peace and prosperity, and towards a universal respect for the equality of rights to human dignity among all peoples.

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

A PRACTITIONERS' POINT OF VIEW ON NATIONAL INFORMATICS POLICIES IN TANZANIA

C. Ndamagi
Tanzania Railways Corporation

CONTENTS

A. INTRODUCTION

B. OVERVIEW OF INFORMATICS IN TANZANIA

i. Introduction
ii. Computer Hardware
iii. Software Availability
iv. Software Packages

C. HUMAN RESOURCES AND TRAINING

i. Human Resource Availability
ii. Training Facilities

D. INFORMATICS INSTITUTIONS IN TANZANIA

i. The Ad-Hoc Computer Advisory Committee
ii. The Computer Association of Tanzania
iii. The Tanzania National Commission for Science and Technology
iv. Educational Institutions
v. Support Infrastructure
vi. Role of the Private Sector
vii. Impact of Informatics on Tanzanian Institutions
viii. Informatics Trends Affecting Tanzanian Institutions

E. PROCEDURES FOR THE PROCUREMENT OF COMPUTERS

i. Selection of Hardware and Software
ii. Guidelines for Hardware and Software Acquisition

F. TOWARDS THE FORMULATION OF AN INFORMATICS POLICY

i. Needs Identification
ii. Steps Already Taken
iii. Future Informatics Policy Issues
    (a) Informatics versus national issues
    (b) The technical aspects of informatics
    (c) International issues
iv. Linkage with Information Policy

G. THE NEED FOR ACTION

   i. Recognition of Informatics as a vital tool
   ii. Setting Priorities
   iii. Training

H. CONCLUSION

I. REFERENCES

A. INTRODUCTION

This paper provides an up-to-date review of the current informatics situation in Zimbabwe including computers, telecommunications, software bases, consultants, education and training, informatics policy, the computer in society, and industrial infrastructure. In Zimbabwe, the link between the informatics and information sectors is slight.

Informatics is a relatively new concept which was first defined by the French Academy in 1966 as "the science of the systematic and effective treatment, especially by automatic machines, of information seen as a medium for human knowledge and for communication in technical, economic and social contexts". Although still valid, this definition has undergone slight modification over the years.

Informatics is closely associated with the concepts and disciplines of information and computer science. The primary concern of informatics is information.

It is, therefore, a technology developed to promote the efficient collection, processing, organization, generation and dissemination of information, for effective application in social, political, economic, technical and other spheres of activity.

Informatics is still evolving. As new developments continue in microelectronics, telecommunications and computer technologies, so informatics changes, and the resulting impact, increase. In order to control informatics development in Tanzania and to achieve a rational system, a national policy is vital. This paper will discuss the content of such a policy in Tanzania, giving particular attention to computer technology, the major driving force behind informatics.

B. OVERVEIW OF INFORMATICS IN TANZANIA

i. Introduction

In Tanzania, the use of information technology with electronic computers began when the first computer, an ICT 1500 mainframe, was installed by the Government in 1965.

Since then, there have been many developments although, as in many developing countries, the pace has been modest. The number of computers, especially of micros, is now growing at a phenomenal rate largely because the silicon chip revolution has made large scale integration (LSI) technology feasible. This has resulted in improvements in computing power at greatly reduced hardware costs.

ii. Computer Hardware

All computer hardware in Tanzania is imported since the requisite local technological infrastructure and expertise is still very low.

Although the importation of computers into Tanzania is controlled and recorded, a precise count of all computers presently in the country is not possible. Records of permits issued to various institutions to import computer systems into the country have existed since 1980 in the Ministry of Finance, Economic Affairs and Planning. These records, however, are not an accurate reflection of all the computers in the country. Some systems for which permits were obtained may not have been imported, because purchasers may have changed to systems entirely different from those for which permits were issued. There are no figures for systems which may have been disposed of. Furthermore, a certain number of systems undoubtedly found their way into the country without being recorded.

The statistics quoted in this paper, therefore, are based on a recent analysis of a sample of 778 computers and related equipment obtained from import-permit records and maintained by the Director of Computer Services, in the Ministry of Finance, Economic Affairs and Planning. No attempt is made to express this sample as a percentage of the total.

On the 778 computer units analysed, more than 66 per cent are in the public sector. The following table shows the distribution of operational computer systems in the public and private sectors in Tanzania.

DISTRIBUTION OF COMPUTERS BY SECTOR

TANZANIA

Sector	Micros	Minis	M/Frames	Other	Total	%
PUBLIC						
i) Government	223	7	3	4	237	30.5
ii) Parastatal	223	23	15	17	278	35.7
PRIVATE	235	16	4	8	263	33.8
Total:	681	46	22	29	778	
Percentage:	87.6	5.9	2.8	3.7		100.0

As expected, most of the hardware is located within 40 km of Dar-es-Salaam, the main commercial centre, reflecting resource availability (personnel, infrastructure, etc.) and market focus.

In recent years, microcomputers have made a significant impact on the Tanzania market. The trend is understandable because microcomputers are becoming cheaper while still retaining all the power necessary for the average user's computing needs. More than fifty different brands are recorded ranging from "Acorn" to "Zenith", and mostly with no after-sales services. According to a 1986 survey, the most popular brand was Apple with a 13 per cent share of the market, followed closely by Wang PCs at 12.5 per cent.

There are still very few mainframes and these are found mostly in large organizations. They account for less than 3 percent of all computer units currently installed. The most common mainframes are the ICL ME29 series, with 10 units in 10 installations, followed by Wang with six units in four installations.

At present there are at least seven active vendors of computer products in Tanzania:

Business Machines Limited (BML):
Agents for Apple and Olivetti equipment;

Computer Corporation of Tanzania Limited (CCTL)
Agents for Wang Computers;

International Computers Limited (ICL):
Represented by Computers and Telecoms Systems
Limited (CATS) for ICL computers;

International Communications Systems Limited (ICS):
Agents for IBM Computers;

MEECO International Limited (MEECO)
Agents for Unisys systems;

NCR Corporation (Tanzania) Limited (NCR)
Representatives of NCR machines;

IMS Computer Limited (IMS)
Agents for Amstrad and Tandon computers;

In 1986, BML led the market with 21.4 per cent of the installed units, followed by CCTL with 16.1 per cent and ICL with 8.8 per cent. Recently, however, Amstrad and IBM PCs have made significant inroads into the local market.

iii. Software Availability

Most computer applications in Tanzania are developed locally. Each installation handles its own software development. In the absence of necessary expertise, local consultancy services are used. Few locally developed standard packages suitable for nationwide use are available to date.

The most obvious aspect of this approach is the unnecessary duplication of efforts in applications and software development. Thus, there a need for a common form for the packaging of such efforts, particularly in view of the meagre personnel resources available.

A complete list of all the installed and operational computer applications is difficult to compose. The most common applications, however, include:

(a) Financial systems - e.g. payroll, pension, accounting, billing, fixed assets registers, insurance policies, savings accounts, debtors and creditors ledgers, costing. etc.

(b) General Management Information Systems - e.g. personnel statistics, stock control, airline passenger reservations, budget control, spreadsheets, etc.

(c) Planning and Development Models - e.g. population census, agricultural census, various statistical systems, hydrology surveys etc.

(d) General Office Automation - e.g. automatic telex message routing and recording, word processing, etc.

During the last seven years, there have been many hardware acquisitions, accounting for more than 97 per cent of the cumulative total since 1965. The development and implementation of new applications, however, has not been as great.

The individual level of sophistication of each application normally varies from institution to institution.

The majority of existing applications are in the financial area, showing that much remains to be done before computers are fully integrated into the overall planning and decision-making process.

iv. Software Packages

There is an almost total lack of ready-made software packages in Tanzania, especially on mainframes. All microcomputer software is imported. This dependence on off-the-shelf software is understandable since most micros are in nonprofessional hands, in terms of software development. Other factors also contribute to the lack of ready made software:

(a) Ineffective software marketing to the users, who remain ignorant of what is available.

(b) Management unwillingness to outlay the investment necessary to develop a computer application.

(c) General ignorance on the subject of information technology, resulting in the commonly held opinion that computers are only useful for payroll and accounts.

C. HUMAN RESOURCES AND TRAINING

i. Human Resource Availability

The number of Tanzanians professionally trained in informatics is still small - probably no more than one to two hundred. This is not adequate to meet present demand. In addition, some of these professionals unfortunately are not in the country and others are in unrelated jobs. The local salary structure for I.T. professionals is partly responsible for this situation. According to the Computer Association of Tanzania, there are about 60 registered members in the professional category.

There is also the semi-professional level with exposure to microprocessing using off-the-shelf software such as wordprocessing, spreadsheets, etc. Over the last two years, more than 300 people have attended such training in local private institutions.

On the non-professional side, there are many Tanzanians who have been exposed to this technology. They include professional accountants, managers, economists, etc. Most professions now include computer studies in their curricula. These are not easily quantifiable but they play a significant role in enhancing the application of the technology.

ii. Training Facilities

Computer science training began in 1969 when supplementary computer science courses were introduced at the University of Dar es Salaam. Development has been slow and training facilities in information technology remain poor, despite recent efforts by the private sector. This may possibly result from the absence of an overall national policy on information. Training facilities and courses exist in the following institutions:

(a) University of Dar es Salaam
After the basic training courses in computer science which began in 1969, a one year postgraduate Master's Degree course in computer science was introduced in 1974. The course has experienced several problems, however, particularly the absence of appropriate teaching staff. Only 12 Tanzanians have attended this course and, of these, not more than six are active professionals in information processing.

(b) Institute of Finance Management
In 1974, it was recommended that the Institute offer higher and professional courses in computer science. To this end, the Institute bought an in-house microcomputer, but its present major application is payroll processing and the data processing course, currently offered, as a complement to accountancy and financial courses.

(c) Institute of Development Management
A similar recommendation was made to the Institute, to offer short courses in computer studies. Preparations were initiated and at least two lecturers were sponsored for computer studies in the UK. Two such lecturers have, however, since left the Institute for jobs elsewhere. Computer courses are run only to complement accountancy courses.

(d) National Institute of Productivity
NIP started short courses and consultancy services in computer studies in 1974 where a specialized unit was established. The unit no longer exists, however, and the staff have left to take up other jobs.

(e) Eastern and Southern Africa Management Institute (ESAMI)
This is a regional management training centre. Short courses and seminars are conducted on a consultancy basis and are offered regularly in systems analysis and design; computer operations management; micro computer courses and programming.

These are the public institutions where professional training in informatics should be taking place. With the exception of ESAMI, however, the performance of the rest is far from satisfactory. Several local institutions in the private sector also conduct training courses in computer studies.

(f) International Computers Limited (ICL)
ICL now offers regular short and full time courses in computer studies in the best equipped training centre in the country.

(g) Dar es Salaam Institute of Computer Science and Management (ICSM)
This institute offers micro-computer based courses in word processing, computer appreciation and BASIC programming.

(h) IMS Computers Limited
The training centre opened recently and offers courses in word processing.

(i) Advanced Commercial Institute
A new course in word processing has recently been introduced at ACI, which is mainly a secretarial training institute.

(j) MEECO International Limited
MEECO plans to establish a new training centre.

All private sector training facilities have emerged within the last three years. It is interesting to note that, while the public sector has remained static, the private sector has become increasingly involved in this area.

Advanced and professional training is only available abroad and, since access to such courses requires foreign exchange, there are considerable limitations on Tanzanian participation.

D. INFORMATICS INSTITUTIONS IN TANZANIA

Computer technology in Tanzania is largely the responsibility of the Treasury, Ministry of Finance, Economic Affairs and Planning. This is the result of historical events rather than of deliberate government policy. The Government Computer Centre, which was the first computer installation in Tanzania, has always been under the Treasury. Thus, all matters pertaining to computer technology were put under the control of the same Ministry. In practice however, Ministry involvement has always been limited to controlling the import of computer hardware.

The need, therefore, for a central government body to be responsible for computer technology has often been expressed in various forms and reports since 1974. The only result to date has been the formation of the Ad-Hoc Computer Advisory Committee.

i. The Ad-Hoc Computer Advisory Committee

The Ad Hoc Advisory Committee was set up in 1974 by the Government to control the acquisition and importation of computers. The ten members are selected from local computer centres and appointed by the Minister of Finance, Economic Affairs and Planning. Its functions are purely advisory: to assess all import permit applications and make the appropriate recommendations to the Minister. The Minister may, however, overrule committee recommendations.

This limited function has gradually become a formality rather than a control mechanism. In some cases, the Committee has queried and sought more clarification on various issues, but no application has ever been turned down. In fact, the Committee has not met for at least two years, but computers continue to be imported under temporary permits. The Committee, therefore, has little influence on informatics affairs.

ii. The Computer Association of Tanzania

The Computer Association of Tanzania, a national association of professionals in the computer field, was officially registered in 1987 with the objective of developing and advancing the use and application of computer technology.

There are two categories of membership: professional (voting) with approximately 60 members to date, and non-professional (non-voting).

Since the Association is not a statutory body, it has no legislative mandate or power to regulate or control the conduct of informatics in Tanzania. It does, however, provide a common forum for discussing professional views on various aspects of informatics with the Government and other relevant bodies. There are indications of Government interest in the Association which has great potential to become a very influential organ in informatics affairs.

iii. The Tanzania National Commission for Science and Technology

The Commission was established by Act of Parliament to replace the Tanzania National Scientific Research Council which was formed in 1968. It is the principal advisory organ to Government on all matters relating to scientific research and technology development.

It is also empowered to establish a National Centre for the development and transfer of technology, including the assessment and choice of imported technology. Although not explicitly mentioned, the Commission's mandate is wide enough to accommodate informatics as another major area of concern. It is hoped that such will be the case.

iv. Educational Institutions

Although there is no common standard, all courses offered in the private sector are classified as vocational training. Course content, examinations, and certification are controlled by the institutions themselves. This is cause for concern. The Computer Association of Tanzania has already taken up matters of standards in informatics training with the relevant organs of the Government.

v. Support Infrastructure

The application and development of informatics cannot be discussed in isolation from the necessary infrastructural support such as communications facilities and electricity supply. Development in this sector, however, has been satisfactory and is more advanced than the present technological needs and capabilities of information processing.

In most urban centres in Tanzania, electricity supply is fairly reliable and stable; most of the country should be covered by the National Grid in the very near future.

There is a reasonably comprehensive telecommunications network serving national, regional and international needs.

At present, teleprocessing is used only by the Air Tanzania Corporation (ATC), with a computer terminal network for passenger reservations covering most of the airline's major operational centres in Tanzania. ATC also subscribes to the SITA international communications network based in the USA. Other institutions are planning similar networks, particularly the Tanzania Posts and Telecommunications Corporation (TPTC) and the National Bank of Commerce (NBC). The TPTC has already imported all the necessary computer equipment, while NBC has acquired the equipment for the first phase of the project.

vi. Role of the Private Sector

To the present, the force behind informatics development has been the private sector and donor agencies. The current direction of informatics in Tanzania is still dictated by the suppliers, at least in terms of hardware acquisition.

The private sector also offers local training facilities which, with proper government control, should help alleviate the personnel shortages.

As yet, the private sector is not effectively engaged in the applications of software support and related consultancy services. A number of software houses have sprung up recently. Since they are not yet well developed, it is too early to predict their future.

vii. Impact of Informatics on Tanzanian Institutions

The application of informatics may be considered under two major headings:

(a) General Data Processing applications of a routine nature such as payroll, accounting, stock control, etc. Such applications generate relatively little information for top management and so have very little influence on decision-making.

(b) Management Information applications including population censuses, hydrological surveys and statistics, early warning systems, international trade statistics, etc. The information supplied is brief and concise and has a significant influence in decision-making.

In Tanzania, a lot has been accomplished at the operational level but relatively little has been accomplished at the tactical level, whether in service rendered to top management, or in the strategic planning level of management.

viii. Informatics Trends Affecting Tanzanian Institutions

The need for informatics products and services is growing very rapidly. The Computer Services Department in the Ministry of Finance, Economic Affairs and Planning receives an average of ten applications per day to import computer equipment. In addition, there are undeclared imports of such material. The period between 1980 and 1988 accounts for over 97 per cent of all computer acquisitions in Tanzania since 1965.

The number of computer vendors has also increased. In 1980, there was only one Company (ICL) dealing exclusively in computer products but this number has increased to at least seven - this does not include smaller businesses dealing in stationery, magnetic media and other accessories.

Training institutions in the private sector are also mushrooming. In 1985, only two institutions offered training courses; presently, there are at least six training centres offering elementary courses in computer studies. During the last three years more than 300 people have attended micro-computer based training in these private centres. Numbers of courses and participants continue to increase.

The requirement for computer networking is also emerging and three large institutions have already shown interest. Telefax, is another innovation causing much excitement. A few telefax units have already been installed by several local firms and organisations.

All these developments show the mounting interest in informatics. The Government cannot again ignore developments and ban informatics products and services, as it did in the past. It must acknowledge the existence of the technology and formulate appropriate strategies for its effective application. This would seem to be the only practical option for the Government to be prepared for these new developments.

E. PROCEDURES FOR THE PROCUREMENT OF COMPUTERS

i. Selection of Hardware and Software

The Minister of Finance, Economic Affairs and Planning has the power to permit or prohibit the importation of any computer equipment, and the mandate to exercise control over the selection of equipment. In practice, this is not now applied and the customer is free to choose any computer from any vendor or donor. The type of computer equipment imported, therefore, is actually controlled by the vendors, or, in the case of donated equipment, by the donor. As a result, some computer equipment is under- and over-configured depending on the customer's financial ability; others have no local after-sales support, and the material supplied may be behind the current state-of-the-art. There is such a wide variety of different computer brands in the country that some, especially micros, are unused for lack of expertise or servicing facilities.

It is not clear how the problem can be remedied, without the imposition of unnecessarily restrictive measures, unless competition for business between local vendors becomes a major influence.

ii. Guidelines for Hardware and Software Acquisition

The Guidelines for Computer Acquisition came into effect in 1974. Before then, computers were imported freely by the few institutions which could afford them. This new development was a result of Government dissatisfaction with computer services of the time.

Because of dissatisfaction with the system of uncontrolled importation, in 1974, the Government published an order under the Imports Control Ordinance absolutely prohibiting all importation of computer equipment into Tanzania. Soon afterwards, a provision was added empowering the Minister for Finance, Economic Affairs and Planning to permit such imports if they were judged to be in the public interest. Hence the "Guidelines for Evaluation of Computer Requests for Import of Computer Equipment", were formulated. In summary, it stated that:

(a) To justify an in-house mainframe installation, the applicant must have had extensive experience with computer applications, and have a comprehensive technical manpower base, supported by a management team knowledgeable in the application of computer technology.

(b) To justify an in-house minicomputer, the applicant must have had extensive experience on electrical/electronic accounting machines and a thorough understanding of computer technology.

(c) Any application will only be considered if available local capacity cannot satisfy the applicant's requirements. Otherwise, users are encouraged to use available resources on time-hire basis, in order to conserve resources.

F. TOWARDS THE FORMULATION OF AN INFORMATICS POLICY

i. Needs Identification

The need to develop a policy or control mechanism for computer technology arose in 1974. This was nine years after the installation of the first computer by the Government. Before this time, the Government and several institutions had acquired in-house computers.

By 1972, the Government had, with expatriate assistance, computerised at least seven applications, including Government payroll, water billing, national provident fund, pension benefits, motor vehicles registration, Government accounts and police crime records. In that year, however, disadvantageous developments occurred, including:

(a) The expiry of expatriate contracts at the end of 1972, which resulted in:

- a shortage of expertise in the systems and programming cadre;
- system maintenance becoming a problem because of the absence of proper system documentation;
- new systems not developed.

(b) The implementation of the Government Decentralisation Policy, by which accountability became regional instead of central. In the process, document flow was adversely affected and the Government accounting system slowed down. Most applications, with the exception of Government payroll and the pensions system, got into arrears or fell into disuse.

By 1974, the situation was acute and the Government decided to revert to the use of accounting machines, after questioning both the relevance and necessity of computers. There had already been one disastrous experience with the computer at the now defunct State Trading Corporation and the Government feared that similar occurrences could effect its own installations.

The Government, therefore, appointed two independent teams to study and report on the viability and utilisation of the computers already installed in the country such as the Tanzania Electric Supply Company, Tanzania Farmers Association, and the East African Railways Corporation which seemed to be operating satisfactorily. The teams were:

(a) The National Institute of Productivity (NIP) in co-operation with and under the sponsorship of the International Labour Organisation (ILO) - the ILO/NIP Study Team. Their report, on Computer Development in Tanzania, included recommendations on:

- the formulation of a National Policy on Computer Technology (acquisition and utilisation);
- a National Training Programme in Computer Science, consisting of short, higher and professional courses.

(b) The Government Computer Task Force - mainly made up of computer staff from the Government Computer Services Centre was formed specifically to report on computer utilisation in the country, including:

- computer utilisation in existing computer installations;
- analysis of installed computer applications;
- manpower;
- recommendations on the retention of some and the discarding of others; etc.

The Task Force recommended:

- the retention of almost all computers in the country;
- the setting up of a government advisory body on computer technology;
- the formation of a secretariat within the advisory body, consisting of professionals in computer technology, to oversee technology developments in the country;
- the formulation of detailed guidelines on computer acquisition in Tanzania.

Most of the recommendations of both study teams were adopted and some were implemented. Unfortunately, the formation of a National Policy Body on Computer Technology is still pending. The formulation of guidelines on the acquisition of computers was implemented almost immediately which involved the formation of the Ad-hoc Computer Advisory Committee.

ii. Steps Already Taken

Between 1974 and 1980, there was little addition to the number of installed computers in Tanzania. This, however, was due more to the unfavourable economic climate than to any restriction of computer imports. It caused three significant draw backs: the tempo of the introduction of training in computer science slackened significantly; some professionals in computer technology either left the field or sought employment outside Tanzania; and, more significantly, the issue of policy formulation was set aside.

Beginning in 1980, however, the situation changed dramatically. The computers of the sixties and early seventies were aging and becoming more erratic in performance; maintenance was an increasing problem because with changing technology, spares for old equipment were scarce. The East African Community had collapsed and former component corporations, with long experience in computerisation, were desperately looking for alternative computer services to revive their systems. As a result, requests for new computer equipment began to flow into the Ministry of Finance.

Between 1980 and 1986, over 500 new computers and related equipment were acquired. More than 85 per cent of these were microcomputers. Computer sales outlets had increased from one to four; by 1988 this number had risen to eight. With the proliferation of computers came the establishment of private training centres.

The revival of interest created the need for an information policy. Thus, in 1985, the National Science and Technology Policy for Tanzania was issued by the Ministry of Finance, Economic Affairs and Planning which included the statement that:

> "The provision of up-to-date and efficient scientific information systems including libraries, documentation centres, computer systems, etc. shall be recognised as vital tools and components in strengthening the nation's scientific and technological capability."

The Government established the Tanzania National Commission for Science and Technology in place of the Tanzania National Scientific Research Council which had existed since 1968. In 1987, the Ministry of Finance, Economic Affairs and Planning, the University of Dar es Salaam and the Intergovernmental Bureau of Informatics (IBI) jointly held an international conference on informatics which recognised the need for a comprehensive informatics policy.

In December 1987, the Minister for Finance, Economic Affairs and Planning formed a Task Force for Informatics Development, consisting of eight members appointed from the Planning Division of the Ministry, the University of Dar es Salaam, the Tanzania National Commission for Science and Technology and the Ministries of Communications and Works, Agriculture and Education. The purpose of the Task Force was to "study and recommend to the Government the actions required to ensure appropriate progress in informatics development in Tanzania".

The Computer Association of Tanzania has also stressed to the Government the need to control and standardise training in computer studies.

These are all promising developments towards the formulation of an informatics policy, but as yet no such policy exists. It is hoped that this will be remedied in the very near future.

iii. Future Informatics Policy Issues

The IBI Document Policy Considerations on Informatics / Telecommunications describes informatics as being divided into three distinct levels: strategy planning, the formulation of policy to guide governmental units, and the translation of policies into public services such as education, health or agriculture, supported by various physical systems including computers and telecommunication networks.

In Tanzania, the strategy for science and technology development has already led to the establishment of the Tanzania National Commission for Science and Technology. The guiding policy recognizes scientific information systems, including computer systems, as vital tools and components in strengthening the nation's scientific and technological capacity. To this extent, it could be said that a strategy for informatics development already exists.

The formulation of policies focused on the national strategy is still to be carried out. In this effort, salient issues for consideration, may be grouped into three distinct categories:

(a) Informatics versus national issues

Every technology including informatics has social, economic and political implications. The policy should, therefore, take certain sensitive factors into consideration, including:

- labour and employment issues;
- individual privacy rights and protection;
- cultural implications;
- involvement of the private sector in informatics development;
- priority areas and allocation of resources;
- balance of political power and the definition of rights of access to public information.

(b) Technical aspects of informatics

The technical issues to be considered include:

- equipment: should not conflict with national interests such as labour opportunities, national sovereignty and integrity etc.
- the vendor: the policy should define vendor obligations such as a requirement for a viable infrastructure for after-sales engineering support, training, etc.
- the user: relevant areas include a comprehensive strategy in education and training catering to technical and non-

technical disciplines; legal aspects of the technology; laws applicable to the sale, export and use of computers; patents and copyrights on computer-related products; etc.

- support infrastructure: the quality and services of the major support systems of informatics, electricity, telecommunications and computers, must be ensured through a co-ordinated strategy for their meaningful development.

- standardization: the level of acceptable standards in training and physical support systems such as telecommunications equipment, etc. must be defined.

(c) International issues

Since there is an interdependence between nations, any informatics policy should include issues such as transborder data and information flows; intellectual property rights; potential areas of regional or international co-operation, including the use of satellites, surveillance systems, etc.

iv. Linkage with Information Policy

Information processing has advanced from the traditional batch processing approach to interactive on-line computing, which has facilitated faster information flows and an increasingly more effective utilisation of computers. There is now a growing interdependence between computer systems and telecommunications facilities.

The technological considerations involved may, however, be too sophisticated for the installed telecommunications system, the main function of which was voice transmission.

It may, therefore, be necessary to allocate further resources in an effort to match the requirements of computing with telecommunications facilities. Financial resources, however, are unfortunately scarce and the nation may have other priorities. There is also a requirement for some measure of co-ordination between the various informatics support sectors, which may be difficult to achieve because of unfavourable administrative arrangements.

In Tanzania, such co-ordination may be a problem because of the administrative structure. For instance, information policy comes within the responsibility the First Vice President and Prime Minister; computer technology is under the Ministry of Finance, Economic Affairs and Planning; while telecommunications is part of the Ministry of Communications and Works. The bureaucratic processes and the different priorities in the various sectors tends to retard the progress of informatics. Policy-makers must effectively address the issue of streamlining needs.

G. THE NEED FOR ACTION

Not all weaknesses at the policy-making level of government can be tackled at the same time. Each selected problem will have to be tackled methodically to achieve policy objectives. The present requirement is for a strategy on both short and long term priorities.

In the meantime, while planners and policy-makers ponder the issues, informatics products will continue to flow into the country unhindered. There is a risk that the situation could be out of control before a comprehensive policy is formulated and implemented. Fortunately, as in most developing countries, there has not been a lot of investment in computerisation in comparison with developed countries. The issues which could be addressed immediately include:

i. Recognition of informatics as a vital tool

In many developing countries computer technology often is not regarded as a distinct discipline which must be managed by its own professionals. The Tanzanian Government must deliberately recognise the discipline of informatics and develop its requisite resources accordingly.

ii. Setting priorities

The Government should then choose priority areas for computerisation and encourage the indigenous development of computer applications and software relevant to local conditions. Software is increasingly more lucrative in the developed countries and much seeps into Third World economies, thus stifling local talent and draining scarce foreign exchange. Whilst it may not be possible to be self-sufficient in every aspect of software and applications development, Governments should give deliberate encouragement to the local availability of such services. Joint efforts could prove effective in this respect by using the limited equipment available more efficiently and effectively.

iii. Training

One of the major problems at present is the lack of proper training strategies in informatics. Available statistics show that the number of computers in Tanzania exceeds available trained personnel. The unco-ordinated state of available training facilities carries possible disastrous long term implications. There is, therefore, an immediate need for an institutionalized strategy for training in informatics including the definition of standards, development of course content, preparation of examinations and setting of certification requirements.

H. CONCLUSION

At a Southern African Regional Workshop on Informatics for Development held at Victoria Falls, Zimbabwe, in May, 1986, Thomas Ennison Jr. Legal Counsel of IBI, introduced his paper with the following words, which are a fitting conclusion here: "

> Informatics holds a promise of a better life for the developing countries. These countries missed the Industrial Revolution and have since not really found their way into the society created by that revolution. In the meantime, however, they have been overtaken by events in the rushing tide of the Informatics revolution which is creating a different kind of world in a so-called Information Society. ... with the right kind of strategies and policies in the use of Informatics, the developing countries can and should make a direct bid for the technology which is driving the revolution, and use it to pry open the gateway to their economic and cultural salvation. This is the opportunity which Informatics gives to developing countries."

I. REFERENCES

1. ENNISON, T., Jr. Strategies for Making Informatics a Development Tool. Proceedings of the Southern African Workshop on Informatics for Development. Ministry of Finance, Economic Planning and Development, Zimbabwe; 12-18 May, 1986; Victoria Falls, Zimbabwe.

2. IBI GUIDELINES FOR A NATIONAL POLICY FOR EDUCATION IN INFORMATICS; SPIN 101, April, 1976; p. 5, 36.

3. IBI POLICY CONSIDERATIONS ON INFORMATICS/TELECOMMUNICATIONS; SPIN 103 Rev; April, 1986; p. 2.

4. IFIP COMPUTERS AND THE LAW. IFIP Newsletter, Vol. 5, No. 2, 1988, p. 1.

5. MINISTRY OF FINANCE, ECONOMIC AFFAIRS AND PLANNING, Tanzania. The National Science and Technology Policy for Tanzania, 1985, p. 33.

6. MUNASINGHE, M. Computer and Informatics Issues, and Policy for Third World Development, Information Technology for Development, Oxford University Press; Vol 2, No. 4; Dec. 1987; p. 312.

7. NDAMAGI, C. Information Technology in Government - The Case of Tanzania. Proceedings of the Southern African Workshop on Informatics for Development, CFTC; April, 1987, Rusape, Zimbabwe.

8. TANZANIA GOVERNMENT BILLS SUPPLEMENT, Notice of the Tanzania Commission for Science and Technology Act, 1986. April 1986.

NATIONAL INFORMATION AND INFORMATICS
POLICIES IN AFRICA:
REPORT AND PROCEEDINGS OF A REGIONAL SEMINAR

Addis Ababa, Ethiopia
28 November - 1 December 1988

SECTION V

ABSTRACTS OF
OTHER SEMINAR PAPERS

Note: Copies of these papers can be obtained by writing to:

PADIS/ECA
P.O. Box 3001
Addis Ababa
ETHIOPIA

EXPERIENCES OF NORTH AFRICAN COUNTRIES IN THE FORMULATION OF NATIONAL INFORMATION POLICIES.

AHMED A. BASSIT

The paper gives some information on existing policies for development. It outlines the components of a science policy and its principles. The paper further emphasizes the important role science policy plays in national development.

The usefulness of accurate information to policy-makers is emphasized in the paper. The paper also defines what is meant by a National Information Policy. Policies in the Arab countries, related to information utilization, dissemination, and processing have been described in the paper. The paper also tries to show the difference between information and informatics policies in relation to the environments of the Arab countries. The planning of national informatics and information policies is treated in the paper as a case study, for the Sudan, Tunisia and Algeria. These three countries have working policies in the Arab world.

NATIONAL INFORMATION POLICY IN ZIMBABWE:

A PRACTITIONER'S POINT OF VIEW.

S.R. DUBE

The paper describes the developments taking place in Zimbabwe, towards evolving a National Information Policy. According to the paper, the exercise to have Government recognize the need for a National Information Policy started in 1980, the independence year of Zimbabwe. The Zimbabwe Library Association was the most active agency in the campaigns which were then followed by the establishment of a National Library Service by Government.

The paper further describes the National Library and Documentation-Service Act, which came into being in Zimbabwe in 1985. The paper then describes in detail the functions of the National Library Service. The modalities of establishing a national information policy are also described in the paper.

PLANNING, INFORMATION AND INFORMATICS

ECA'S SOCIO-ECONOMIC PLANNING AND RESEARCH DIVISION

The paper emphasizes the importance of information for planning, and gives the inter-relationships of planning, information and informatics, in the context of the experience of African countries. The historical development of planning by African countries is described in the paper. According to the paper, African countries shared in the general movement of ideas and after independence they practically took up planning as a major tool of economic and social development. Their approach was not uniform, in the sense that a few of them such as Algeria, or Egypt chose a form of planning akin to the type of central planning developed in the Soviet Union, whilst most of them opted for various types of indicative planning.

The paper further describes the socio-economic difficulties which were/and are being experienced by the African countries around the mid 1970's and to the present time, and it discusses the inter-relationship between information and planning. According to the paper, the lack of information has played a key role in the failure or disappointing performance of planning in Africa. The paper then outlines the areas on which information is required, e.g. natural resources, population structures and change, reproduction, etc.

The paper concludes by recommending that development plans/or programs should include national information/informatics sector plan. In addition, the sectoral plan should include policies to ensure that computerization is carried out according to the interests of the country concerned.

INFORMATION TECHNOLOGY IN GOVERNMENT:

THE AFRICAN EXPERIENCES

MOHAN KAUL AND HAN CHUN KWONG

The paper provides an outline regarding developments in Information Technology in the developing countries. It shows that computerization in developing countries should not be considered as a recent phenomenon, since, for example, Iran started using computers in 1954.

The paper further outlines the activities of some international agencies, which have been studying the development of Information Technology in the governments of the developing countries. The paper notes that the studies that have so far been carried out did not take into consideration the computerization of Africa. To fill this gap the paper notes, the Commonwealth Secretariat initiated a research project in 1987 to study public sector computerization in Africa, whose objectives were to:

- carry out a comparative study of experience with use of the new technologies by governments in Africa, and to learn about the strategies and processes followed by countries in promoting computerization in government.
- assess the current impact on management systems, organizational structures and policy framework which have evolved in response to technological needs.
- identify and evaluate the needs and problems in the adoption and use of new information technologies for further actions by the concerned governments. Countries in different states of computerization, Botswana, Gambia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Sierra Leone, Tanzania, Zambia and Zimbabwe, were included in this study.

The organizational processes and mechanisms of IT activities in Africa is also discussed in this paper. It is revealed in the paper that there is some form of central co-ordination of IT activities in most of the African countries. The paper concludes by recommending that there is the need for national-level planning in Information Technology development.

NATIONAL INFORMATION POLICY:
THE ETHIOPIAN EXPERIENCE

TEFERI KEBEDE

The paper describes the efforts that have been made by Ethiopia to establish a national agency for the purpose of planning for improvements in scientific information services, of promoting the growth of scientific library resources, and of developing qualified manpower. The paper also discusses the various efforts made and the approach chosen to formulate a national information policy.

According to the paper, the need for a National Scientific and Technological Information Centre in Ethiopia was studied in 1977. A seminar which then highlighted major issues involving the planning of an Ethiopian National Scientific and Technological Information System was organized in April 1984. As a follow up to the recommendations of the seminar, the government of Ethiopia established a National Scientific and Technological Information Centre in 1986.

The paper asserts that, though at the moment, Ethiopia does not have an Information and Informatics Policy, the overall Ethiopian Science and Technology Policy, incorporates an information policy for Ethiopia. The paper concludes by stating that, Ethiopia has officially recognized the importance of an information policy, and efforts are underway in the country to have one instituted.

NATIONAL INFORMATION POLICY FORMULATION PROCESS IN ZAMBIA SINCE 1970.

MAURICE LUNDU

The paper describes the steps being taken to formulate a national information policy for Zambia. The paper describes the immediate post-independence period, during which, according to the paper, the information profession was dominated by expatriates and, at the time, the role of information in modern societies had not been recognized by the new African political leaders, planners, and bureaucrats.

UNESCO's concepts, namely: National Information Systems (NATIS), and World Information Systems in Science and Technology, according to the paper, have transformed the thinking of decision-makers in Zambia, to appreciate the role information plays in planning and decision-making. The efforts of PADIS of creating sub-regional centres is also applauded in the paper as having played a big role in transforming the attitudes of Zambians towards information. The paper outlines the steps so far taken by Zambia to evolve a National Information Policy. These steps began with the seminar that was organized by the Zambia Library Association in 1985, with the theme "The Need for Development-Oriented National Information Policy in Zambia" within the context of the Southern African Documentation and Information System (SADIS). This seminar came up with proposals for a National Information Policy for Zambia, which has submitted to the Party and Government for consideration. The paper concludes by outlining the elements that make up this policy.

POLICY-MAKERS' VIEWS ON INFORMATION/INFORMATICS POLICY:

THE ZAMBIAN EXPERIENCE

DR. MAURICE LUNDU

The role of information in the management of the economy is described in the paper, and it is shown that one reason why Zambia's National Development Plans fail is because of difficulties of accessing proper information and data, as identified in a 216 page report presented to the Party's 10th General Council. The paper concludes by advising both the planner and policy-makers in Zambia to play an active role in the formulation and implementation of a national information policy in Zambia.

NATIONAL INFORMATION POLICY IN TANZANIA:
ATTEMPTS AT FORMULATION: A PRACTITIONER'S VIEW

O.C. MASCARENHAS

The paper first of all provides some background information related to the meaning of a policy, what national policies can do and which agencies have been carrying out some work in this area. The paper describes, libraries, documentation/information centres, and archives as key components of a National Information Policy. Reasons for a lack of a National Information Policy in Tanzania have also been outlined in the paper, among them being, information not being treated as a sector in itself, information not seen as important, and uncertainties within the information profession.

Attempts to co-ordinate information activities in Tanzania have also been described in the paper, the earliest of these being the co-ordination of libraries by the Tanzania Library Service whose main function is to provide a network of public libraries in Tanzania. In conclusion, the paper states that events in Tanzania indicate the growing consensus among information professionals of a need for greater co-operation within and among the three information sub-sectors, namely, Librarianship, Documentation and Archives. This realization stems from the fact that the potential role of information for development has not been adequately met by the current services. Corollary to this, is the awareness that no one service/institution can adequately provide the information needs for development and that a more co-ordinated approach may go a long way towards achieving the goal.

NATIONAL INFORMATICS POLICIES

A PRACTITIONER'S POINT OF VIEW: ZAMBIA

M. NDHLOVU SHITIMA

The paper gives some background in relation to a national informatics policy in Zambia, and states that in terms of the existing laws in Zambia, a national informatics policy does not exist. However, the paper goes on to state that, there exist in Zambia some administrative procedures which take care of the would be functions of a policy.

The administrative procedures existing in Zambia, according to the paper are to regulate the acquisition of both hardware and software in order to minimize proliferation of computers and facilitate proper selection and utilization of equipment and hence ensure efficient utilization of very scarce foreign exchange resources.

The paper then describes the institution that has the responsibilities of carrying out the administrative procedures. The date during which this institution came into being, its composition and functions are described in detail in this paper.

Efforts being made in Zambia to have a national informatics policy drawn by the government of Zambia have been outlined in the paper.

INFORMATICS AND UNESCO

UNESCO IIP

According to the paper, informatics has been one of the major preoccupations of UNESCO since the 1950's. To promote international co-operation in informatics, UNESCO has created the International Calculus Centre (ICC), that became after some years the International Bureau of Informatics. It has also supported the International Federation of Information Processing (IFIP).

The paper describes the objectives, of the Intergovernmental Informatics Programme (IIP) of UNESCO which was created in 1975 to promote international co-operation by the means of collaborative projects. The paper further describes the Management Structures of the Intergovernmental Informatics Programme. The paper concludes by suggesting that IIP may be considered as an international network for co-operation in informatics, since each country has its focal point and each region its vice-president. This will allow for circulation of ideas, information and projects, between countries and institutions in informatics.